

ALASKA LEGISLATURE SPECIAL COMMITTEE/SUBJECT FILE 8672  
2055 SCOMM 78: SENATE SPEC. COMM. ON OIL & GAS, 1991-1992

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In December 1988 the towed barge Nestucca was holed off Grays Harbor and spilled residual oil equivalent to no. 5 or no. 6 fuel. This oil washed up along Washington beaches to the north even up to Vancouver Island and including beaches of the Olympic National Park. Much concern resulted about oil contamination of the beaches; considerable cleanup efforts were made, and most oiled material was removed. To our knowledge, data from studies of the chemical persistence of this oil along the Washington coast are not yet available.

The long term fate of a no. 5 fuel oil spilled in a coastal bay of British Columbia north of Washington State was observed six times during four years after the spill (Cretney et al., 1978). Disappearance of the lower molecular weight and n-alkane components was noted during the first 4 years, but the non-n-alkane components in the  $C_{25}$ - $C_{30}$  range seemed more resistant. Aromatic hydrocarbons were not reported. This study of a heavy fuel oil suggests similar oils in nearby Washington State coastal zone would last from one to four years.

Some 2.5 million gallons of Bunker C were spilled into Chedabucto Bay, Nova Scotia in the wreck of the tanker Arrow on 4 February 1970. Chemical residues of this oil and its biological effects have been carefully studied and summarized by Keizer et al. (1978); Thomas (1978); and NAS (1985). Chemical analyses show traces of oil residues from the tanker persisted for over six years in intertidal sediments of the bay, and some organism populations were still stressed, but the bulk of the oil and its effects had disappeared after six years.

Thus, studies of residual oil spills in Washington and British Columbia coastal zones agree with those of aftermath of the tanker Arrow in Nova Scotia that the heavy residual fuel oils will most likely persist for several years in the coastal sediments.

## NOTES

1. The details of this approach are described more fully by Leschine et al. (1989).
2. Much of this discussion of the Alaska civil penalty scheme is excerpted from Graham (1989), and Rubin (1989) which should be consulted for further details.
3. More precisely, the oil's API Gravity is used; see Appendix II. API Gravity is derived from specific gravity. It is also strongly related to viscosity. (see Figs. 6 and 7 below.)
4. Patterned after the "mechanical and toxicity sensitivity" (sic) ratings of M. Dethier's report Rankings of Productivity, Diversity, and Oil Sensitivity for Marine and Estuarine Habitat Types in Washington. Note that this usage represents an inversion of the classification system actually developed by Dethier. Whereas she first defined 35 marine and estuarine habitat types and then rated each on the 1-5 scale of her report, we take the scale values as representing distinct classes with respect to susceptibility into which habitat types can then be sorted. (The wording of the definitions is modified slightly for consistency with this report.)
5. In technical terms the scoring model we are developing is a version of the multilinear model described by Edwards and von Winterfeldt (1986). The critical assumption is that both differences in the value attached to spills of a more versus less toxic oil in a given habitat and differences associated with a spill of the same oil type in a more versus less sensitive habitat type are entirely accounted for by differences in associated values in the tables. Specialists will recognize this as a special case of the condition known as "multilinear difference independence" (Edwards and von Winterfeldt 1986, p. 326 ff.).
6. Numerous procedures exist to develop numerical weights reflective of the relative importance a decision maker might attach to the influence of one factor versus another in scoring formulas. All depend to some extent on decision-maker supplied inputs. Elicitation procedures are described in detail by Edwards and von Winterfeldt (1986). The assumption that scores can be combined additively, with or without weights, depends on a condition Edwards and von Winterfeldt term "additive difference independence." Essentially we are assuming that societal or decision-maker concern for each of these four aspects of unquantifiable oil spill damage is unaffected by the extent of damages in the other three categories. See pp. 326 ff. of their book.

7. Specific gravity and API gravity or density are related by the formula  $\text{Degrees API} = 141.5 / \text{sp. gr. } 60^{\circ}/60^{\circ}\text{F} - 131.5$ . The material spilled in the 1989 MCN #5 barge spill had a specific gravity of 1.086, translating into an API gravity of -1.21, and making it a highly unusual product to be encountered in a marine oil spill.

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## Appendix I

ALASKA'S CLASSIFICATION OF PETROLEUM, PETROLEUM PRODUCT, AND BY-PRODUCT TOXICITY used in the assessment of civil penalties for spills of the above, from 18 ACC 75 Article 5.

- I. Highly Toxic (toxicity factor 1.0)
  - A. numbers 1,2 and Arctic diesel fuel and heating oil;
  - B. jet aviation fuels A and B;
  - C. motor gasoline including aviation gasoline;
  - D. kerosene; and
  - E. stationary turbine fuels;
- II. Moderately Toxic (toxicity factor 0.75)
  - A. waste oil and waste oil mixtures;
  - B. lubricating oil;
  - C. jet fuels other than those specified in (I)(B) of this subsection; and
  - D. crude oil;
- III. Less Toxic (toxicity factor 0.5)
  - A. bunker and residual fuel oils; and
  - B. hydraulic fluids;
- IV. Relatively Nontoxic (toxicity factor 0.25)
  - A. asphalts;
  - B. tars; and
  - C. other petroleum, petroleum products, and by-product not listed in (I) - (III) of this section.

To determine the toxicity factor for a specific crude oil, the toxicity factor 0.75 is multiplied by:

$(\text{API gravity of the crude oil}) / 30.$

ALASKA'S CLASSIFICATION OF PETROLEUM, PETROLEUM PRODUCTS, AND BY-PRODUCTS DEGRADABILITY used in assessment of civil penalties for spills of the above, from 18 AAC 75 Article 5.

I. Low Degradability (degradability factor 1.0)

- A. asphalt;
- B. tar;
- C. bunker and residual fuel oils; and
- D. other petroleum, petroleum products, and by products not otherwise listed in (II.) or (III.) of this section;

II. Moderate Degradability (degradability factor 0.5)

- A. hydraulic fluids;
- B. lubricating oil;
- C. waste oils and waste oil mixture; and
- D. crude oil;

III. High Degradability (degradability factor 0.25)

- A. motor gasoline, including aviation gasoline;
- B. numbers 1, 2 and Arctic diesel fuel and heating oil;
- C. jet and stationary turbine fuels; and
- D. kerosene.

To determine the degradability factor for a specific crude oil, the degradability factor is multiplied by:

$30/(\text{API gravity of the crude oil}).$

ALASKA'S CLASSIFICATION OF PETROLEUM, PETROLEUM PRODUCT AND BY-PRODUCT DISPERSIBILITY used to assess civil penalties for spills of the above, from 18 AAC 75 Article 5.

- I. Highly Dispersible (dispersibility factor 0.15)
  - A. motor gasoline, including aviation gasoline;
  - B. all jet fuels;
  - C. kerosene;
  - D. numbers 1,2 and Arctic diesel fuel and heating oil;
  - E. hydraulic fluids; and
  - F. stationary turbine fuels;
- II. Moderately dispersible (dispersibility factor 0.5)
  - A. emulsified oil mixtures;
  - B. lubricating oils;
  - C. waste oil and waste oil mixtures: and
  - D. crude oils;
- III. Low Dispersibility (dispersibility factor 1.0)
  - A. bunker and residual fuel oils;
  - B. asphalts;
  - C. tars; and
  - D. other petroleum, petroleum products, and by-products not otherwise listed in (I) or (II) of this section.

## Appendix II - Definitions

### Aqueous Solubility

Aqueous solubility can be determined from Henry's law,  $CP = HC$ , where P is pressure in atmospheres, C is concentration in solution, and H is Henry's law constant.<sup>1</sup>

### Aromatic Hydrocarbons<sup>2</sup>

Aromatic hydrocarbons...contain one or more aromatic (benzene) rings connected as fused rings (e.g., naphthalene) or lined rings (e.g., biphenyl). Petroleum contains many homologous series of aromatic hydrocarbons consisting of unsubstituted or parent aromatic structures (e.g., phenanthrene) and like structures with alkyl side chains that replace hydrogen atoms. Alkyl substitution is most prevalent in 1-, 2-, and 3-ringed aromatics, although the higher polynuclear aromatic compounds (>3 rings) do contain alkylated (1-3 carbons) side groups. The polycyclic aromatics with more than 3 rings consist mainly of pyrene, chrysene, benzanthracene, benzopyrene, benzofluorene, benzofluoranthene, and perylene structures. The naphthenoaromatic compounds consists of mixed structures of aromatic and saturated cyclic rings. This series increases in importance in the higher boiling fractions along with the saturated naphthenic series. The naphthenoaromatics appear related to resins, kerogen, and sterols. Petroleum generation usually involves the formation of some naphthenoaromatic structures.

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<sup>1</sup>National Research Council (NRC), Oil in the Sea: Inputs, Fates, and Effects (Washington: 1985, National Academy Press), p. 273.

<sup>2</sup>This is taken in whole from the NRC, p.18.

### **Flash Point**

The flash point of petroleum or a petroleum product is the lowest temperature to which the product must be heated to give off sufficient vapor to cause the vapor above the sample to mix with air and, ignite by a specified flame.<sup>4</sup>

### **Fuel Oils<sup>5</sup>**

Domestic fuel oils are those used primarily in the home and include kerosene, stove oil, and furnace fuel oil; they are distillate fuel oils. Diesel fuel oils are also distillate fuel oils, but residual oils have been successfully used to power marine diesel engines, and mixtures of distillates and residuals have been used on locomotive diesels. Heavy fuel oils include a variety of oils ranging from distillates to residual oils that must be heated to 260° C (500°F) or more before they can be used. In general, heavy fuel oils consist of residual oils blended with distillates to suit specific needs. Included among heavy fuel oils are various industrial oils; when used to fuel ships, heavy fuel oil is called bunker oil.

### **Pour Point**

The pour point of an oil is defined as the lowest temperature at which movement of oil is observed to flow.<sup>6</sup>

### **Surface and Interfacial Tension**

Surface tension is a measure of the forces acting at a boundary between two phases; if the boundary is between a liquid and a solid or between a liquid and a gas

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<sup>4</sup>American Society for Testing and Materials (ASTM), *1982 Annual Book of Standards*, part 23 - Petroleum Products and Lubricants (1), sect. D56, Easton MD.

<sup>5</sup>This comes in entirety from Speight, pp. 439.

<sup>6</sup>ASTM, part 23, sect. D97.

(air) the attractive forces are referred to as surface tension, but the attractive forces between two immiscible liquids are referred to as interfacial tension.<sup>7</sup>

### Viscosity

Viscosity is the most important single fluid characteristic governing the motion of petroleum products.<sup>8</sup> It is a measure of the internal resistance to motion of a fluid by the forces of cohesion between molecules or molecular groupings. Viscosity may be defined as the force in dynes required to move a plane of  $1\text{-cm}^2$  area at a distance of 1 cm from another plane of  $1\text{-cm}^2$  area a distance of 1 cm in 1 second.<sup>9</sup> Viscosity is a function of temperature, pressure, and rate of shear. Spill viscosity increases with weathering as evaporation removes the lighter fractions, and decreases with increasing temperature.<sup>10</sup> Fluidity is the reciprocal of viscosity.

### Volatility

The volatility of a liquid or liquified gas may be defined as its tendency to vaporize, that is to change from the liquid to the vapor or gaseous state.<sup>11</sup> The vapor pressure controls the evaporation rate and air concentration of hydrocarbons, and therefore, the fire hazard in the vicinity of oil spills.

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<sup>7</sup>This paragraph comes, in entirety, from Speight, p. 89.

<sup>8</sup>Speight, p.81.

<sup>9</sup>Speight, p. 81.

<sup>10</sup>NRC, p. 272.

<sup>11</sup>Speight, p. 95.

# 4 Pre Draft reg's

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#4

CHAPTER 173-183 WAC

PREASSESSMENT SCREENING REGULATIONS

173-183-010 Purpose  
173-183-020 Authority  
173-183-030 Applicability

173-183-100 Definitions

173-183-200 Preassessment Screening  
173-183-210 Incident Discovery and Reporting  
173-183-220 Initial Site Evaluation  
173-183-230 Preassessment Screening Committee  
173-183-240 Preassessment Screening Committee Duties  
173-183-250 Preassessment Screening Options  
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decides what  
to do after  
a spill - RDA  
or table approach

WAC 173-183-010 Purpose.

The purpose of this chapter is to establish a formal preassessment committee and screening process for evaluating resource damages resulting from oil spills to waters of the state causing the death of, or injury to, fish, animals, vegetation, or other resources of the state. The Marine Resource Damage Assessment (MRDA) committee, utilizing the preassessment screening process, shall determine whether a detailed resource damage assessment investigation should be conducted or whether the compensation schedule authorized under RCW 90.48.366 and 90.48.367 should be used to assess damages.

WAC 173-183-020 Authority.

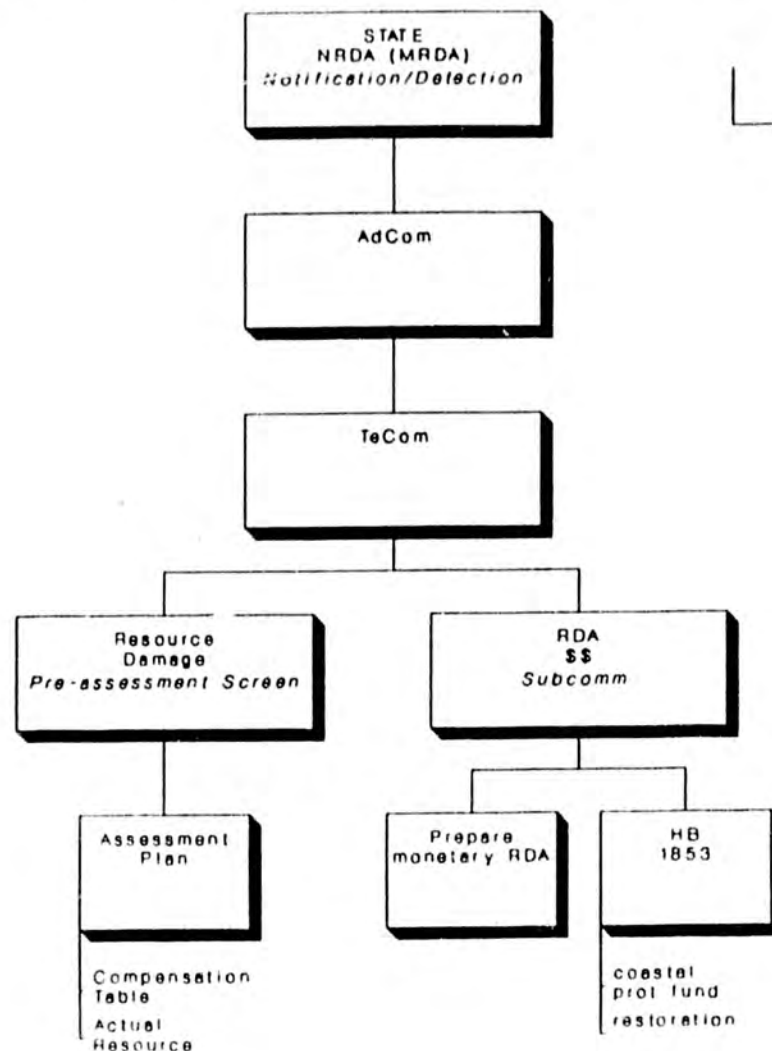
This regulation implements chapter 90.48.368 RCW of the Water Pollution Control Act, as amended in 1987, 1989 and 1991, and includes in part the Clean Water Act, 33 U.S.C. 1251-1376, which the legislature has empowered the department to implement.

WAC 173-183-030 Applicability.

This chapter shall apply to all petroleum discharges into the waters of the state. Under this chapter, the department may require or take any and all actions necessary to investigate and assess damages from those releases.

# NATURAL RESOURCE DAMAGE ASSESSMENT

## Integration of 1853 & 1854 Into MRDA



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NRDA

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#### WAC 173-103-100 Definitions

- (1) "Adequate compensation" means the amount determined sufficient to compensate for the loss or diminution in value of unquantifiable damages or damages not quantifiable at a reasonable cost.
- (2) "Adverse environmental effect" means any detrimental impact on the well being or usefulness of a public resource.
- (3) "Compensation schedule" means the set of procedures used to determine the monetary value owed to the state as compensation for unquantifiable damages or for damages not quantifiable at a reasonable cost, developed under the guidelines provided in RCW 90.48.366.
- (4) "Committee" means the preassessment screening committee established under RCW 90.48.368.
- (5) "Damaged resource" means a resource that has sustained injury as result of an oil discharge.
- (6) "Damages" means the amount of monetary compensation necessary to (a) restore any damaged resource to its condition before sustaining injury as a result of an oil discharge, to the extent technically feasible, including any loss in value incurred during the period between injury and restoration in cases where damages are quantifiable at a reasonable cost, or (b) adequately compensate for the loss or diminution in value as determined by the compensation schedule rules provided in this chapter in cases where damages are unquantifiable or not quantifiable at a reasonable cost.
- (7) "Department" means the department of ecology.
- (8) "Director" means the director of the department of ecology.
- (9) "Discharge" means any spilling, leaking, pumping, pouring, emitting, emptying, or dumping.
- (10) "Fund" means the state coastal protection fund as provided in RCW 90.48.390 and 90.48.400.
- (11) "Immediate removal" means the timely dispersal, containment or elimination of oil(s) in a manner which helps prevent significant injury or damage to public resources.
- (12) "Injury or injuries" means a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge of oil.
- (13) "Loss in services" means a temporary or permanent reduction in the ability of the resource to provide its use or benefit to the public or to other resources.
- (14) "Loss in value or lost value" of a damaged resource means the amount equal to the sum of consumptive, nonconsumptive, and indirect use values, as well as lost taxation, leasing, and licensing revenues during the period between injury and restoration; indirect use values may include existence, bequest, option, and aesthetic values.
- ( ) "Marine Resource Damage Assessment (MRDA) Committee"
- (15) "Oil" or "oils" means oil, including gasoline, crude oil, fuel oil, diesel oil, lubricating oil, sludge, oil refuse, liquid natural gas, propane, butane oils distilled from coal, and other liquid hydrocarbons regardless of specific gravity, or any other petroleum related product.
- (16) "On scene coordinator" (OSC) means the department official who supervises the spill response team and compiles the initial report concerning the facts

and circumstances of the spill for the department.

(17) "Person" means any political subdivision, government agency, municipality, industry, public or private corporation, copartnership, association, firm, individual, or any other entity whatsoever and its owner, operator, master, officer or employee of a ship.

(18) "Potentially liable party" means the person or persons who may be liable for damages resulting from an oil spill.

(19) "Preassessment screening" means the investigation and determination of the facts and circumstances surrounding an oil spill which are used to determine whether a damage assessment investigation should be conducted, or alternatively, whether the compensation schedule will be used to assess damages.

(20) "Public resources" or "publicly owned resources" means any natural, recreational, aesthetic or other property held in trust by and for the people of this state.

( ) "Resource Damage Assessment (RDA) Coordinator"

(21) "Reasonable cost" for a damage assessment means a cost that is anticipated to be less than the amount of damages that may have occurred or may occur.

(22) "Receiving environment" means waters of the state where resources are injured or likely to be injured by an oil spill.

(23) "Restoration or enhancement projects or studies" means an activity that is intended to restore or replace environmental, recreational, or aesthetic resources, either to conditions prior to the injury or to the extent technically feasible, as such conditions are determined by the department, for the benefit of Washington's citizens.

(24) "Scientific Advisory Board" means the advisory group established by the department to assist in development of the compensation schedule as required by RCW 90.48.366.

(25) "Ship" means any boat, ship, vessel, barge, or other floating craft of any kind.

(26) "Technical feasibility or technically feasible" means that given available technology, a restoration or enhancement project can be successfully completed at a cost that is not disproportionate to the value of the resource before the injury.

(27) "Spill" means any leaking, pumping, pouring, emitting, emptying, dumping or discharge.

(28) "Unquantifiable damage" means any diminution in value of a public resource that cannot be measured in a manner which ensures that the people of the state will be adequately compensated for any short-term and long-term damages sustained as a result of an oil spill.

(29) "Waters of the State" shall include lakes, rivers, ponds, streams, inland waters, underground water, salt waters, estuaries, tidal flats beaches and lands adjoining the seacoast of the state, sewers, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

#### WAC 173-183-200 Preassessment Screening.

Preassessment Screening is the investigation and screening of the facts and circumstances surrounding an oil spill prior to any formal designated approach to resource damage assessment. These findings will be used to determine whether a formal damage assessment investigation should be conducted or whether the compensation table (WAC 173-184) will be used to assess the environmental and recreational damages. The purpose of this section is to set forth the procedures for selecting the appropriate option for damage assessment and compensation for environmental damages associated with releases of oil into state waters as defined under chapter RCW 90.48.142.

#### WAC 173-183-210 Incident Discovery and Reporting.

The state On-scene Coordinator (OSC), or initial Ecology responder, shall provide prompt notice to the Marine Resource Damage Assessment (MRDA) Committee when there is evidence of a discharge of oil into state waters in violation of RCW 90.48.142.

#### WAC 173-183-220 Initial Site Reconnaissance.

(1) The On-scene-Coordinator (OSC), or initial responder, shall be responsible for:

- (a) the initial determination of the character of the oil(s),
- (b) documentation of the initial location, type of habitat, extent and amount of the discharge, and
- (c) a preliminary analysis of the discharge's potential to cause resource injuries.

(2) The following guidelines describe how the conditions under which a preassessment screening committee will be appointed:

- (a) Oil spills of less than 25 gallons

(i) If in the judgement of the OSC that less than 25 gallons of oil have been discharged, there are no apparent resource injuries or harm, and all appropriate clean up activities have been accomplished the OSC shall inform the Ecology Resource Damage Assessment Coordinator that it may not be necessary to convene a MRDA preassessment screening committee to further evaluate the spill.

(ii) If the Ecology Resource Damage Assessment (RDA) Coordinator determines from the information provided by the OSC that resultant oil exposure and damage to the environment is limited, the RDA coordinator shall advise MRDA and the director that the Resource Compensation Table will automatically be used to determine the appropriate compensation for damage to public resources.

(b) Oil spills of greater than 25 gallons or smaller spills that have not been adequately addressed by the responsible party

(1) If in the judgement of the OSC that more than 25 gallons of oil has been spilled or that the responsible party has inadequately addressed spill control the OSC shall request the Ecology RDA Coordinator to have the MRDA committee initiate the preassessment screening process to determine the appropriate way to address resource damage assessment.

(ii) If the Ecology RDA Coordinator determines from information provided by the OSC that exposure of public resources to the spill has been significant, or the spill has caused or may cause significant resource injuries, the coordinator shall recommend that the department convene a preassessment committee as soon as possible, but no later than 24 hours after the OSC has notified MRDA.

(3) The Resource Damage Assessment (RDA) Coordinator shall prepare a formal request with the Director to appoint a preassessment screening committee based on an evaluation of the information provided by the OSC.

(4) Concurrent with the submittal of a formal request to the director for appointment of a preassessment screening committee (173-183) the MRDA committee (standing in for the preassessment committee until it is appointed) will initiate all other necessary reconnaissance activities to determine:

(a) further identification of resources at risk

(b) whether these public resources are, or may be, adversely affected, taking into consideration preventative or cleanup activities to contain or remove the oil(s) so that there is a reduced possibility of quantifiable damage.

(c) documentation of actual or potential injury to those resources, and

(d) whether additional local, state, federal agencies and Indian Tribes may have interests and jurisdiction over any of the public resources in the receiving environment

#### 173-183-230 Preassessment Screening Committee.

(1) Once the Director has authorized the formation of a preassessment screening committee the department, as chair, shall determine which representatives will be needed on a spill-by-spill basis. One member from each of the departments of fisheries, wildlife, natural resources, and the parks and recreation commission will serve as a core committee to be supplemented by the Department of Health, Emergency Management, as well as other state, federal and local agencies, and tribal and local governments whose presence would enhance the reconnaissance or damage assessment aspects of the spill response.

(2) Each core agency shall provide an alternate member in the event that the primary member is unavailable.

(3) If a representative that has been requested to participate declines to do so, that representative shall provide prompt written notice to the department after 12 hours so that a replacement member may be appointed.

within

(4) Prompt consideration will be given to other local, state, federal, or tribal government requests for participation on a spill-by-spill basis.

#### **173-183-240 Preassessment Screening Committee Duties.**

(1) The committee shall convene as soon as possible following appointment.

(2) The preassessment screening process shall occur concurrently with reconnaissance and cleanup activities and that information as well as other relevant or background information pertaining to the resource or its use shall be considered during the preassessment process.

(3) The primary duty of the committee is to determine whether a damage assessment investigation should be conducted under RCW 90.48.367, or alternatively, whether the compensation schedule authorized under RCW 90.48.336 should be used to assess damages.

(4) The committee shall consider the following factors when determining what type of damage assessment should be conducted:

(a) Whether evidence from reconnaissance investigations suggests that injury has occurred or is likely to occur to publicly owned resources;

(b) the potential loss in services provided by resources injured or likely to be injured and the expected value of the potential loss;

(c) whether a restoration project to return lost services is technically feasible;

(d) the accuracy of damage quantification methods that could be used and the anticipated cost-effectiveness of applying each method;

(e) the extent to which likely injury to resources can be verified with available quantification methods; and

(f) whether the injury, once quantified, can be translated into monetary values with sufficient precision and accuracy.

(5) When the committee finds that the conditions of a spill make it likely that a damage assessment study authorized under RCW 90.48.367 may be warranted, the department shall notify the potentially liable party of this decision.

(6) The committee may accept restoration or enhancement projects or studies proposed by the potentially liable party in lieu of some or all of:

(a) the damages calculated from the compensation schedule authorized under RCW 90.48.366; or

(b) the claims from damage assessment studies authorized under RCW 90.48.367.

(7) The department may negotiate with a potentially liable party to perform restoration and enhancement projects or studies which may substitute for all or part of the compensation authorized under RCW 90.48.366 or the damage assessment studies authorized under RCW 90.48.367.

(8) The committee is encouraged to work cooperatively with the potentially liable party, to the greatest extent possible, to increase the efficiency of the damage assessment process. The preassessment screening process shall

provide for the ongoing involvement of the potential liable party.

#### 173-183-250 Preassessment Screening Decision Options

(1) The preassessment committee may utilize either the Compensation Schedule authorized under WAC 173-184 or may chose to initiate a detailed resource damage assessment. *under CERCLA TYPE B*

(2) The Compensation Schedule. The department shall use the compensation schedule to determine the amount of damages if the committee determines that:

(a) Restoration or enhancement of the injured resources is not technically feasible;

(b) damages are not quantifiable at a reasonable cost; and

(c) the restoration and enhancement projects or studies proposed by the potentially liable party are insufficient to adequately compensate the people of the state for resource injuries likely sustained as a result of the oil spill.

(3) Formal Resource Damage Assessment. Damage assessment studies authorized under RCW 90.48.367 may only be conducted if the committee, after considering the factors enumerated in subsection (3) of WAC 173-183-240, determines that the damages to be investigated are quantifiable at a reasonable cost and that proposed assessment studies are clearly linked to quantification of the damages incurred.

(a) When damage assessment studies are approved by the committee, the state trustee agencies responsible for the resource(s) and/or habitat injured or potentially injured as a result of an oil spill shall conduct the damage assessment related to their trustee resources.

(b) The committee shall approve the scope of the damage assessment taking into consideration the factors enumerated in subsection (3) of WAC 173-183-240 and subsection (b) of this section.

(4) As new information becomes available, the committee may reevaluate the scope of damage assessment using the factors listed in subsection (3) of WAC 173-183-240 and subsection (b) of this section, and may reduce or expand the scope of damage assessment as appropriate.

#### 173-183-260 Participation.

In order to efficiently implement 173-183-250 the preassessment committee shall develop public resource damage assessment agreements to facilitate cooperation between state and federal agencies and Indian Tribes. Agreements concerning the use of the appropriate damage assessment methodology for public resources with overlapping or delegated jurisdictions may be negotiated on a case-by-case basis by the committee.

#### **173-183-270 Annual Report.**

Actions and decisions on all oil spills must be included in the annual legislative report which incorporates the facts and circumstances surrounding the spill, a brief description of the decisions made for determining damages from the compensation schedule or resource damage assessment, the amount of compensation determined to be owed and the actual amount collected from the responsible party for the oil discharge.

## CHAPTER 173-184 WAC

### OIL SPILL COMPENSATION SCHEDULE REGULATIONS

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#### WAC 173-184-010 Purpose.

The purpose of this chapter is to establish a compensation schedule that will provide a simple methodology for assessing damages to public resources from oil spills. The intent is to provide an alternate methodology to the extensive and expensive natural resource damage assessments presently being conducted after

oil spills. This chapter provides the methodology for establishing the importance of the public resources affected by the spill and addresses the impacts of oils on the environment via the relative toxicity of the oil released to the environment. Additionally, utilizing the above information, this chapter describes the procedure for determining the appropriate monetary compensation for loss of public resources associated with the spill incident.

#### **WAC 173-184-020 Authority.**

This regulation implements the establishment of a resource damage compensation schedule consistent with the provisions of RCW 90.48.366 for the discharge of oil in violation of RCW 90.48 and RCW 90.56. The department, in consultation with the departments of fisheries, wildlife, and natural resources, and the parks and recreation commission, and with the assistance of a scientific and technical advisory boards, shall establish the compensation schedule as a method of assessing damages as the result of an oil spill.

#### **WAC 173-183-030 Applicability.**

This chapter shall apply to all petroleum discharges into the waters of the state. Under this chapter, the department may require or take any and all actions necessary to assess damages from those releases.

#### **WAC 173-184-040 Revisions.**

The department shall review this chapter at least once every three years and appropriate revisions reflecting new or revised information shall be incorporated into the compensation schedule.

#### **WAC 173-184-100 Definitions. (also refer to WAC 173-183-100 Definitions)**

(1) "Coastal environment" means the area incorporating: (a) the splash area, which lies above the extreme high water level of spring tide; (b) the upper shore, which lies between the average high tide level and the extreme high water level of spring tides; (c) the midshore, which lies between the average low tide level and the average high tide level; (d) the lower shore, which lies between the extreme low water of spring tides to the average spring tide level; and (e) the sublittoral fringe, which lies below the extreme low water level of spring tides.

(2) "Estuarine environment"

(3) "Marine environment"

#### **WAC 173-184-200 The Compensation Schedule.**

(1) The compensation table is designed to provide a simplified methodology for resource damage assessments. The methodology is based on minimal field observations to determine injury, quantify that injury and determine damages to the waters of the state.

(2) The table is designed around a ranking of environmental and recreational use parameters and how those parameters are adversely impacted by the various

oils transported in the state. The table is designed with the following principles in mind:

(3) The compensation schedule shall reflect adequate compensation for unquantifiable damages or for damages not quantifiable at a reasonable cost for any adverse environmental, recreational, aesthetic, or other effects caused by the oil discharge.

(4) The amount of compensation assessed under this schedule shall be no less than one dollar per gallon of oil spilled and no greater than fifty dollars per gallon of oil spilled.

#### **WAC 173-184-210 Resource Damage Assessment Using the Compensation Schedule**

(1) The compensation schedule shall include:

(a) a relative ranking for each of the classes of oil defined in this chapter as determined by their known chemical, physical and mechanical properties, and other properties that may affect the severity and persistence of the impact on the receiving environment, including living organisms and recreational and aesthetic resources;

(b) a relative vulnerability ranking for coastal, marine and inland waters and adjacent wetland environments which takes into account the vulnerability of the following resources to oil spills: habitat, marine birds, marine mammals, fishery species, and recreation; and

(c) a quantitative method for determining compensation for an oil spill based on the oil and environmental rankings designed to compensate the people of this state for those damages that cannot be quantified at a reasonable cost and for those unquantifiable damages that result from oil spills.

(d) a method for taking into account actions taken by the potentially liable party that:

(i) demonstrate a recognition and affirmative acceptance of responsibility for the spill, such as the immediate removal of oil and the amount of oil removed from the environment; or

(ii) enhance or impede the detection of the spill, the determination of the quantity of oil spilled, or the extent of damage, including the unauthorized removal of evidence such as injured fish or wildlife.

#### **173-184-220 Oil Class Ranking.**

(1) The purpose of this section is to provide a relative toxicity ranking for each of the classes of oil defined in this chapter. The ranking is based on their known chemical, physical and mechanical properties, as well as other properties that may affect the severity and persistence of the oil on the receiving environment. Six classes of oil are ranked for their propensity to cause environmental harm via acute toxicity, mechanical injury and persistence. These oil classes are:

- (a) Prudhoe Bay crude oil.
- (b) Bunker C.
- (c) No. 2 fuel oil.
- (d) gasoline.
- (e) kerosene, and
- (f) kerosene-type jet fuel.

(2) The relative ranking scores for the classified oils shall be those provided in Table -- . ("Leschine, T., R. Carpenter, and E. Gideon, 1991, Petroleum Toxicity Relationships for the Washington Compensation Schedule, College of Ocean and Fishery Sciences, University of Washington, Seattle").

Table -- . Acute Toxicity, Mechanical Injury and Persistence Relative Ranking Scores for Classified Oils (OIL).

| <u>Oil</u>                | <u>Acute<br/>Toxicity</u> | <u>Mechanical<br/>Injury</u> | <u>Persistence</u> |    |       |
|---------------------------|---------------------------|------------------------------|--------------------|----|-------|
| Prudhoe Bay Crude         | 1                         | 4                            | 5                  | 10 | 45.45 |
| Bunker C                  | 1                         | 5                            | 5                  | 11 | 50.0  |
| No. 2 Fuel Oil            | 3                         | 4                            | 2                  | 9  | 40.91 |
| Gasoline                  | 5                         | 1                            | 1                  | 7  | 31.82 |
| Kerosene                  | 2                         | 3                            | 1                  | 6  | 27.27 |
| Kerosene-type<br>Jet Fuel | 5                         | 3                            | 1                  | 9  |       |

(3) In cases where the spilled oil is not described by any of the classes of oil listed in subsection (1) of this section, the department shall determine the acute toxicity, mechanical injury and persistence scores for the spilled oil for purposes of using the compensation schedule by:

(i) assigning the acute toxicity, mechanical injury and persistence scores of the classified oil best describing the spilled oil, or

(ii) calculating the relative ranking scores using the methodology detailed in Leschine et al. (1991) and information on properties of the spilled oil such as percent-weight of the oil's 1-, 2-, and 3-ring aromatic compounds, the aqueous solubility of these compounds and the specific gravity of the oil.

(1) The purpose of this section is to describe the method of ranking the quality of the marine and estuarine receiving environments and to evaluate the impacts of oil spills on that environment for the purposes of assessing damages via the compensation table.

(2) Estuarine and marine waters, including coastal environments, of Washington were divided into 16 regions and -- subregions. Where appropriate, because of biological differences, open water and shorelone habitats were also identified. These zones and subzones, for purposes of RCW 90.48.366, are designated on the maps attached as appendix 1 of this chapter.

(3) For each subzone a Subregional Vulnerability Score (SVS) was calculated. This score is designed to rate all public resources and evaluate their vulnerability to spilled oil. Vulnerability of resources to oil was determined by the propensity of the oil to cause acute toxicity and mechanical injury as well as rate how long the oil persists in the environment. Seasonal vulnerability was determined by summing the seasonal SVS for marine birds, marine mammals, marine fish, recreational use and habitats. The ranking formula is as follows:

Subregional Vulnerability Score(SVS)<sub>i,j</sub> =

HVS<sub>i</sub> + BVS + MVS + FVS + RVS

where HVS<sub>i</sub> = habitat vulnerability score to oil's propensity to cause i

BVS = marine bird vulnerability score

MVS = marine mammal vulnerability score

FVS = fisheries species vulnerability score

RVS = recreation vulnerability score

i = acute toxicity, mechanical injury, or persistence

j = fall, winter, spring or fall

#### 173-184-231 Habitat Vulnerability.

(1) The purpose of this section is to describe the methodology for calculating the Habitat Vulnerability Score (HVS) portion of the Subregional Vulnerability Score (SVS) described in WAC 173-184-230 (c).

(2) The ranking method employs a model to compare the various types of habitats, their sensitivity to each oil class and evaluate acute toxicity, mechanical injury and persistence effects on those habitats in order to establish a Habitat Vulnerability Score (HVS):

Habitat Vulnerability Score(HVS)<sub>i</sub> =

$$[(PPS_i + SPS_i + DS_i)/3] * HSS_i)^{-2}$$

where: PPS = primary productivity score  
 SPS = secondary productivity score  
 DS = diversity score  
 j = habitat type

HSS = habitat sensitivity score  
 i = acute toxicity, mechanical injury or  
 persistence.

(3) The Habitat Vulnerability Score (HVS) for a habitat type shall be increased by a factor of 1.5 when eelgrass, kelp, salt marsh or predesignated rare habitats are associated with the habitat type.

(4) Thirty-five categories of marine and estuarine habitats were initially ranked (Table --) on a 1-5 basis in terms of primary productivity (PPS), secondary productivity (SPS), and diversity (DS). (Dethier, M. 1990. Rankings of Productivity, Diversity and Oil Sensitivity for Marine and Estuarine Habitat Types in Washington).

**Table -- . Relative Ranking Scores for Coastal, Marine, Intertidal and Estuarine Habitats based on Primary Productivity, Secondary Productivity and Diversity.**

| Habitat Class                                      | Primary Productivity | Secondary Productivity | Diversity |
|----------------------------------------------------|----------------------|------------------------|-----------|
| <b>ESTUARINE INTERTIDAL</b>                        |                      |                        |           |
| (a) open rocky shores                              | 3                    | 3                      | 3         |
| (b) open mixed-coarse beaches & low marsh          | 3                    | 3                      | 4         |
| (c) open gravel beaches                            | 1                    | 2                      | 1         |
| (d) open sandy beaches                             | 3                    | 4                      | 2         |
| (e) sandy low marshes                              | 4                    | 3                      | 2         |
| (f) mixed-fine beaches and low marshes             | 5                    | 5                      | 4         |
| (g) saline lagoons                                 | 4                    | 3                      | 3         |
| (h) low-salinity lagoons                           | 3                    | 2                      | 2         |
| (i) mud flats                                      | 3                    | 3                      | 2         |
| (j) high salt marshes                              | 3                    | 3                      | 2         |
| (k) transition zone wetlands                       | 3                    | 3                      | 2         |
| <b>ESTUARINE SUBTIDAL</b>                          |                      |                        |           |
| (l) shallow subtidal rock & boulders               | 4                    | 3                      | 3         |
| (m) deep subtidal rock and boulders                | 2                    | 4                      | 4         |
| (n) shallow subtidal cobble and mixed-coarse areas | 3                    | 3                      | 3         |
| (o) deep subtidal cobble and mixed coarse areas    | 1                    | 3                      | 2         |

|                                                |   |   |   |
|------------------------------------------------|---|---|---|
| (p) shallow subtidal sandy or mixed-fine areas | 3 | 4 | 3 |
| (q) deep subtidal sandy or mixed fine areas    | 1 | 3 | 2 |
| (r) shallow subtidal muddy bays                | 3 | 3 | 2 |
| (s) deep subtidal muddy bays                   | 0 | 3 | 2 |

#### MARINE INTERTIDAL

|                                                  |   |   |   |
|--------------------------------------------------|---|---|---|
| (a) exposed and semi-exposed rocky shores        | 4 | 5 | 5 |
| (b) sand-scoured rocky shores                    | 3 | 4 | 4 |
| (c) protected rocky shores                       | 3 | 3 | 3 |
| (d) semi-exposed cobble and mixed coarse beaches | 2 | 4 | 4 |
| (e) semi-exposed gravel beaches                  | 1 | 2 | 1 |
| (f) exposed sandy beaches                        | 1 | 3 | 1 |
| (g) semi-protected mixed-fine beaches            | 3 | 4 | 3 |
| (h) protected mud flats                          | 4 | 4 | 2 |

#### MARINE SUBTIDAL

|                                                 |   |   |   |
|-------------------------------------------------|---|---|---|
| (i) shallow subtidal rock and boulders          | 5 | 4 | 5 |
| (j) deep subtidal rock and boulders             | 2 | 4 | 5 |
| (k) deep subtidal cobble and mixed-coarse areas | 1 | 3 | 2 |
| (l) shallow subtidal mixed-coarse to mixed fine | 5 | 4 | 4 |
| (m) shallow subtidal gravel or mixed-fine areas | 2 | 3 | 3 |
| (n) deep subtidal sand                          | 0 | 2 | 1 |
| (o) deep subtidal mixed-fine areas              | 1 | 3 | 2 |
| (p) deep subtidal muddy areas                   | 0 | 2 | 2 |

(5) The Habitat Sensitivity Score (HSS) determines the habitat sensitivity to acute toxicity, mechanical injury and persistence. Table -- . lists those scores (Dethier (1991):

Table -- , Relative Rank Scores for Marine and Estuarine Habitats based on Sensitivity to Acute Toxicity, Mechanical Injury and Persistence of Spilled Oil

| Habitat Class                                         | Acute<br>Toxicity<br>Score | Mechanical<br>Toxicity<br>Score | Persistence<br>Score |
|-------------------------------------------------------|----------------------------|---------------------------------|----------------------|
| ESTUARINE INTERTIDAL                                  |                            |                                 |                      |
| (a) open rocky shores                                 | 3                          | 4                               | 3                    |
| (b) open mixed-coarse<br>beaches & low marsh          | 3                          | 3                               | 3                    |
| (c) open gravel beaches                               | 5                          | 1                               | 2                    |
| (d) open sandy beaches                                | 4                          | 3                               | 2                    |
| (e) sandy low marshes                                 | 4                          | 3                               | 3                    |
| (f) mixed-fine beaches<br>and low marshes             | 4                          | 4                               | 4                    |
| (g) saline lagoons                                    | 4                          | 4                               | 5                    |
| (h) low-salinity lagoons                              | 3                          | 4                               | 5                    |
| (i) mud flats                                         | 4                          | 2                               | 5                    |
| (j) high salt marshes                                 | 2                          | 4                               | 5                    |
| (k) transition zone wetlands                          | 2                          | 4                               | 5                    |
| ESTUARINE SUBTIDAL                                    |                            |                                 |                      |
| (l) shallow subtidal rock &<br>boulders               | 3                          | 3                               | 2                    |
| (m) deep subtidal rock and<br>boulders                | 2                          | 2                               | 3                    |
| (n) shallow subtidal cobble<br>and mixed-coarse areas | 2                          | 3                               | 3                    |
| (o) deep subtidal cobble and<br>mixed coarse areas    | 1                          | 2                               | 3                    |
| (p) shallow subtidal sandy or<br>mixed-fine areas     | 3                          | 3                               | 3                    |
| (q) deep subtidal sandy or<br>mixed fine areas        | 2                          | 3                               | 4                    |
| (r) shallow subtidal muddy<br>bays                    | 3                          | 2                               | 5                    |
| (s) deep subtidal muddy bays                          | 2                          | 2                               | 5                    |
| MARINE INTERTIDAL                                     |                            |                                 |                      |
| (a) exposed and semi-<br>exposed rocky shores         | 4                          | 3                               | 2                    |
| (b) sand-scoured rocky<br>shores                      | 4                          | 3                               | 2                    |
| (c) protected rocky shores                            | 4                          | 3                               | 3                    |

|                                                  |   |   |   |
|--------------------------------------------------|---|---|---|
| (d) semi-exposed cobble and mixed coarse beaches | 3 | 3 | 3 |
| (e) semi-exposed gravel beaches                  | 1 | 5 | 2 |
| (f) exposed sandy beaches                        | 1 | 5 | 1 |
| (g) semi-protected mixed-fine beaches            | 2 | 3 | 4 |
| (h) protected mud flats                          | 2 | 4 | 5 |

#### MARINE SUBTIDAL

|                                                 |   |   |   |
|-------------------------------------------------|---|---|---|
| (i) shallow subtidal rock and boulders          | 3 | 3 | 2 |
| (j) deep subtidal rock and boulders             | 2 | 2 | 3 |
| (k) deep subtidal cobble and mixed-coarse areas | 2 | 1 | 2 |
| (l) shallow subtidal mixed-coarse to mixed fine | 3 | 3 | 3 |
| (m) shallow subtidal gravel or mixed-fine areas | 1 | 3 | 2 |
| (n) deep subtidal sand                          | 3 | 2 | 2 |
| (o) deep subtidal mixed-fine areas              | 3 | 1 | 4 |
| (p) deep subtidal muddy areas                   | 2 | 2 | 5 |

(6) Subregional habitat vulnerability scores for acute toxicity, mechanical injury and persistence shall be determined by taking the square root of the sum of the weighted habitat vulnerability scores for each of habitat types present in the impacted subregion, where weighting is defined by percent coverage of each habitat type at the time of the spill, as follows:

Subregional Habitat Vulnerability Score (HVS)<sub>i</sub> =

insert formula here

where: PC<sub>i</sub> = Percent-coverage of habitat-type i  
 PPS = primary productivity score  
 SPS = secondary productivity score  
 DS = diversity score  
 i = habitat type

HSS = habitat sensitivity score  
 j = acute toxicity, mechanical injury and persistence

# 173-184-232 Marine Bird Vulnerability.

(1) Each of the marine and estuarine subregions of state waters established in 173-184-231 (b) shall be relatively ranked and scored for marine bird vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Marine bird vulnerability ranking shall take into consideration seasonal presence of species, population status of present species, abundance of present species and species vulnerability to oil spills, where species vulnerability is based on roosting habits, escape behavior, flocking behavior, feeding specialization, population size, reproductive capacity, breeding dispersion, winter dispersion, seasonal exposure to waters where oil spills could occur, and significance of Washington population to total population in each season (Wahl, T.R., S.M. Speich, D.A. Manuwal, K.V. Hirsch, and C. Miller, 1981, Marine Bird Populations of the Strait of Juan de Fuca, Strait of Georgia, and Adjacent Waters in 1978 and 1979. U.S. Environmental Protection Agency, EPA-600/7-81-156).

(3) Marine bird seasonal vulnerability scores for each of the subregions of state waters shall be determined from existing information and based on determinations of the Marine Bird Subcommittee of the Scientific Advisory Board.

(4) Based on the guidance provided in subsection (3) of this section, marine bird seasonal vulnerability scores for the marine and estuarine subregions of state waters are as follows in Table -- :

Table -- . Subregional Marine Bird Vulnerability Score (BVS)

| Subregion | Spring | Summer | Fall | Winter |
|-----------|--------|--------|------|--------|
| 201       | 3      | 2      | 5    | 4      |
| 203       | 4      | 3      | 4    | 3      |
| 204       | 2      | 2      | 2    | 2      |
| 205       | 2      | 3      | 3    | 2      |
| 206       | 2      | 2      | 2    | 2      |
| 207       | 2      | 3      | 3    | 2      |
| 208       | 2      | 2      | 2    | 2      |
| 209       | 2      | 2      | 3    | 4      |
| 301       | 3      | 3      | 5    | 4      |
| 302       | 1      | 1      | 2    | 1      |
| 303       | 2      | 3      | 2    | 2      |
| 304       | 2      | 2      | 3    | 2      |
| 305       | 2      | 2      | 3    | 3      |
| 306       | 4      | 2      | 3    | 3      |
| 307       | 5      | 5      | 4    | 5      |
| 308       | 2      | 1      | 2    | 2      |
| 309       | 2      | 2      | 2    | 3      |
| 310       | 4      | 5      | 4    | 3      |
| 311       | 3      | 1      | 2    | 4      |
| 312       | 2      | 3      | 4    | 4      |
| 313       | 1      | 2      | 3    | 2      |
| 314       | 3      | 5      | 4    | 3      |
| 315       | 2      | 2      | 2    | 2      |

|      |   |  |  |   |
|------|---|--|--|---|
| 316  | S |  |  | S |
| 317  | S |  |  | S |
| 401  | S |  |  | S |
| 501  | S |  |  | S |
| 502  | S |  |  | S |
| 503  | S |  |  | S |
| 504  | S |  |  | S |
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Scientific Advisory Board)

**WAC 173-184-233 Marine Fish Vulnerability.**

(1) Each of the designated marine and estuarine subregions of state waters in WAC 173-184-230 (2) shall be relatively ranked and scored for fishery species vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Marine fishery species vulnerability ranking shall take into consideration species present, habitat preference, population status of species present, abundance, fecundity and sensitivity of life stages.

(3) Marine fishery species seasonal vulnerability scores for each of the subregions of state waters shall be determined from existing information and based on recommendations of the fishery species subcommittees.

(4) Based on the guidance provided in subsection (3) of this section, marine fishery species vulnerability ranking scores (FVS) for the marine and estuarine subregions of state waters are as follows in Table -- :

**Table -- , Subregional Marine Fishery Species Vulnerability Scores (FVS)**

| <u>Subregion</u> | <u>Spring</u>                                                                                     | <u>Summer</u> | <u>Fall</u> | <u>Winter</u> |
|------------------|---------------------------------------------------------------------------------------------------|---------------|-------------|---------------|
| 201              | (in the process of being classified<br>by Marine Fish Subcommittee,<br>Scientific Advisory Board) |               |             |               |
| 203              |                                                                                                   |               |             |               |
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**WAG 173-184-234 Marine Mammal Vulnerability.**

(1) Each of the designated marine and estuarine subregions of state waters described in 173-184-230 (2) shall be relatively ranked and scored for marine mammal vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Scoring shall take into consideration species presence, population status, breeding vulnerability, presence of young, physiological vulnerability, abundance, and other factors influencing species vulnerability.

(3) Marine mammal seasonal vulnerability scores for each of the marine and estuarine subregions of state waters shall be based on existing information and based on determinations made by the marine mammals subcommittee of the Scientific Advisory Board.

(4) Based on the guidance provided in subsection (3) of this section, marine mammal seasonal vulnerability scores for the marine and estuarine subregions of state waters are as follows in Table -- :

**Table --. Marine Mammal Vulnerability Scores**

| <u>Subregion</u> | <u>Spring</u> | <u>Summer</u> | <u>Fall</u> | <u>Winter</u> |
|------------------|---------------|---------------|-------------|---------------|
| 201              |               |               |             |               |
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(in the process of being classified  
by Marine Mammal Subcommittee,  
Scientific Advisory Board)

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**173-184-235 Recreational Vulnerability.**

(1) Each of the designated marine and estuarine subregions of state waters described in 173-184-230 (2) shall be relatively ranked and scored on a 1 to 5 scale for each season.

(2) Marine- and estuarine-related scoring shall take into consideration seasonal level of participation in recreational activities, sensitivity of recreational activities to oil spills, number of recreation sites and types of recreational activities in a subregion.

(3) Marine- and estuarine-related recreational activities seasonal vulnerability scores for each of the subregions of state waters shall be determined from existing information and based on recommendations of the Recreation Subcommittee of the Scientific Advisory Board.

(4) Based on the guidance provided in subsection (3) of this section, marine- and estuarine-related vulnerability ranking scores (RVS) for the marine and estuarine subregions of state waters are as follows in Table -- :

**Table --. Marine- and Estuarine-related Recreation Vulnerability Scores (RVS)**

| <u>Subregion</u> | <u>Spring</u>                                                                                    | <u>Summer</u> | <u>Fall</u> | <u>Winter</u> |
|------------------|--------------------------------------------------------------------------------------------------|---------------|-------------|---------------|
| 201              | (in the process of being classified<br>by Recreation Subcommittee,<br>Scientific Advisory Board) |               |             |               |
| 203              |                                                                                                  |               |             |               |
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### 173-184-240 Inland Lakes and Streams

(1) The purpose of this section is to describe the method of ranking the quality of the inland lakes and stream receiving environments and to evaluate the impacts of oil spills on that environment for the purposes of assessing damages via the compensation table.

(2) Inland lakes and streams of Washington were divided into 62 Water Resource Inventory Areas (WRIA). Where appropriate the WRIA regions were subdivided by Department of Fisheries (WDF) stream numbers. These regions and stream designations, for purposes of RCW 90.48.366, are designated on the maps attached as appendix 1 of this chapter.

(3) For each stream or lake a Subregional Vulnerability Score (SVS) was calculated. This score is designed to rate all public resources and evaluate their vulnerability to spilled oil. Vulnerability of resources to oil was determined by the propensity of the oil to cause acute toxicity and mechanical injury as well as rate how long the oil persists in the environment. Seasonal vulnerability was determined by summing the seasonal SVS for birds, mammals, fish, recreational use and habitats. The ranking formula is as follows:

Subregional Vulnerability Score(SVS)<sub>ij</sub> =

$$HVS_i + BVS + MVS + FVS + RVS$$

where  $HVS_i$  = habitat vulnerability score to oil's  
propensity to cause i

BVS = bird vulnerability score

MVS = mammal vulnerability score

FVS = fish vulnerability score

RVS = recreation vulnerability score

i = acute toxicity, mechanical injury, or  
persistence

j = fall, winter, spring or fall

#### WAC 173-184-241 Habitat Vulnerability.

(1) The purpose of this section is to describe the methodology for calculating the Habitat Vulnerability Score (HVS) portion of the Subregional Vulnerability Score (SVS) described in WAC 173-184-240 (3).

(2) The HVS ranking method employs a model to compare the various types of habitats, their sensitivity to each oil class and evaluate acute toxicity, mechanical injury and persistence effects on those habitats:

Habitat Vulnerability Score(HVS), =

$$(SO * HI) * HSS_i^{-2}$$

where: SO = stream order  
HI = habitat index

HSS = habitat sensitivity score  
i = acute toxicity, mechanical injury or  
persistence.

(3) For each stream a habitat index (HI) is calculated to determine how the stream varies from the natural pristine condition (see scoring manual for details)

Habitat Index (HI) =

$$HI = [(P1 + P2 + P3 + P4 + P5 + P6)/Np] \times f1 \times f2 \times f3 \times f4$$

where: P1 = barriers to natural fish movement  
P2 = urbanization  
P3 = condition of riparian vegetation  
P4 = condition of floodplain  
P5 = land use of watershed  
P6 = flow alteration  
f1 = channel modifications  
f2 = impoundment  
f3 = water quality  
f4 = streambed condition

(4) The Habitat Vulnerability Score (HVS) for a habitat type shall be increased by a factor of 1.5 when predesignated rare habitats are associated with the habitat type.

(4) Most streams in the state vary to some degree from the natural pristine condition as increased activities within individual watersheds have caused decreased stream and lake habitat quality. In order to account for that degradation prior to using the compensation table a habitat index (HI) was utilized to most closely represent existing stream conditions prior to the oil spill. (Fajen and Wehnes, 1981)

#### **WAC 173-184-242 Bird Vulnerability**

(1) Each inland lake and stream established in 173-184-241 (b) shall be relatively ranked and scored for bird vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Bird vulnerability ranking shall take into consideration seasonal presence of species, population status of present species, abundance of present species and species vulnerability to oil spills, where species vulnerability is based on roosting habits, escape behavior, flocking behavior, feeding specialization, population size, reproductive capacity, breeding dispersion, winter dispersion, seasonal exposure to waters where oil spills could occur, and significance of Washington population to total population in each season.

(3) Bird seasonal vulnerability scores for each of the lakes and streams shall be determined at the time of the spill from existing information and based on recommendations of regional and area bird experts.

#### **WAC 173-184-243 Fish Vulnerability**

(1) Each freshwater lake and stream as designated in WAC 173-184-240 (2) shall be relatively ranked and scored for fishery species vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Fish species vulnerability ranking shall take into consideration species present, habitat preference, population status of species present, abundance, fecundity and sensitivity of life stages.

(3) Fish species seasonal vulnerability scores for each lake and stream shall be determined at the time of the spill from existing information and will be based on recommendations of regional and area fishery experts.

#### **WAC 173-184-244 Mammal Vulnerability**

(1) Each freshwater lake and stream as designated in WAC 173-184-240 (2) shall be relatively ranked and scored for mammal vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Scoring shall take into consideration species presence, population status, breeding vulnerability, presence of young, physiological vulnerability, abundance, and other factors influencing species vulnerability.

(3) Mammal seasonal vulnerability scores for each lake and stream shall be determined at the time of the spill from existing information and will be based on recommendations of regional and area mammal experts.

#### **WAC 173-184-245 Recreation Vulnerability**

(1) Each freshwater lake and stream as designated WAC 173-184-240 (2) shall be relatively ranked and scored on a 1 to 5 scale for each season.

(2) Freshwater lake and stream scoring shall take into consideration seasonal level of participation in recreational activities, sensitivity of recreational activities to oil spills, number of recreation sites and types of recreational activities.

(3) Recreational activities seasonal vulnerability scores for each of the freshwater streams and lakes shall be determined from existing information and will be based on recommendations of regional and area recreational experts.

#### 173-184-250 Freshwater Wetlands

(1) The purpose of this section is to describe the method of ranking the quality of the freshwater wetland receiving environment and to evaluate the impacts of oil spills on that environment for the purposes of assessing damages via the compensation table.

(2) Freshwater Wetlands were divided into 4 general classes. These wetland types, for purposes of RCW 90.48.366, are described in appendix -- of this chapter.

(3) For each wetland type a Subregional Vulnerability Score (SVS) was calculated. This score is designed to rate all public resources associated with wetlands and evaluate their vulnerability to spilled oil. Vulnerability of resources to oil was determined by the propensity of the oil to cause acute toxicity and mechanical injury as well as rate how long the oil persists in the environment. Seasonal vulnerability was determined by summing the seasonal SVS for birds, mammals, fish, recreational use and habitats. The ranking formula is as follows:

Subregional Vulnerability Score(SVS)<sub>i,j</sub> =

HVS<sub>i</sub> + BVS + MVS + FVS + RVS

where HVS<sub>i</sub> = habitat vulnerability score to oil's propensity to cause i

BVS = bird vulnerability score

MVS = mammal vulnerability score

FVS = fish vulnerability score

RVS = recreation vulnerability score

i = acute toxicity, mechanical injury, or persistence

j = fall, winter, spring or fall

#### **WAC 173-184-251 Habitat Vulnerability.**

(1) The purpose of this section is to describe the methodology for calculating the Habitat Vulnerability Score (HVS) portion of the Subregional Vulnerability Score (SVS) described in WAC 173-184-250 (3).

(2) The ranking method employs a model to compare the various types of habitats, their sensitivity to each oil class and evaluate acute toxicity, mechanical injury and persistence effects on those habitats in order to establish a Habitat Vulnerability Score (HVS):

Habitat Vulnerability Score(HVS)<sub>i</sub> =

$$(WT * HI) * HSS_i^{1.5}$$

where: WT = wetland type  
HI = habitat index

HSS = habitat sensitivity score  
i = acute toxicity, mechanical injury or persistence.

(3) Wetland types (WT) are based on the Department of Ecology's 1990 Model Wetlands Protection Ordinance Section 4.4.

(4) The habitat index (HI) is described in WAC 173-184-241(3).

(5) The Habitat Vulnerability Score (HVS) for a habitat type shall be increased by a factor of 1.5 when predesignated rare habitats are associated with the habitat type.

#### **WAC 173-184-252 Bird Vulnerability**

(1) Each freshwater wetland established in 173-184-251 (2) shall be relatively ranked and scored for bird vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Bird vulnerability ranking shall take into consideration seasonal presence of species, population status of present species, abundance of present species and species vulnerability to oil spills, where species vulnerability is based on roosting habits, escape behavior, flocking behavior, feeding specialization, population size, reproductive capacity, breeding dispersion, winter dispersion, seasonal exposure to waters where oil spills could occur, and significance of Washington population to total population in each season

(3) Bird seasonal vulnerability scores for each of the lakes and streams shall be determined at the time of the spill from existing information and based on recommendations of regional and area bird experts.

#### **WAC 173-184-253 Fish Vulnerability**

(1) Each freshwater wetland as designated in WAC 173-184-250 (2) shall be

relatively ranked and scored for fishery species vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Fish species vulnerability ranking shall take into consideration species present, habitat preference, population status of species present, abundance, fecundity and sensitivity of life stages.

(3) Fish species seasonal vulnerability scores for each freshwater wetland shall be determined at the time of the spill from existing information and will be based on recommendations of regional and area fishery experts.

#### **WAC 173-184-244 Mammal Vulnerability**

(1) Each freshwater wetland as designated in WAC 173-184-250 (2) shall be relatively ranked and scored for mammal vulnerability to oil spills on a 1 to 5 scale for each season.

(2) Scoring shall take into consideration species presence, population status, breeding vulnerability, presence of young, physiological vulnerability, abundance, and other factors influencing species vulnerability.

(3) Mammal seasonal vulnerability scores for each freshwater wetland shall be determined at the time of the spill from existing information and will be based on recommendations of regional and area mammal experts.

#### **WAC 173-184-245 Recreation Vulnerability**

(1) Each freshwater wetland as designated WAC 173-184-240 (2) shall be relatively ranked and scored on a 1 to 5 scale for each season.

(2) Freshwater wetland scoring shall take into consideration seasonal level of participation in recreational activities, sensitivity of recreational activities to oil spills, number of recreation sites and types of recreational activities.

(3) Recreational activities seasonal vulnerability scores for each of the freshwater wetlands shall be determined from existing information and will be based on recommendations of regional and area recreational experts.

CHAPTER 173-185 WAC

DETERMINATION OF COMPENSATION

- 173-185-010 Purpose
- 173-185-020 Authority
- 173-185-030 Applicability
  
- 173-185-100 Definitions

173-185-200 Compensation Schedule Approach  
173-185-210 On-Scene-Coordinator (OSC) Responsibilities  
173-185-220 Preassessment Screening Committee Responsibilities  
173-185-230 Determination of Compensation

173-185-300 Modification of Compensation Based on Actions taken by the Responsible Party.

173-185-400 Appeal

173-185-500 Severability

**WAC 173-185-010 Purpose** The purpose of this chapter is to describe the method for determining appropriate compensation for resource losses

**WAC 173-185-020 Authority**

**WAC 173-185-030 Applicability**

**WAC 173-185-200 Compensation Schedule Approach.**

The purpose of this section is to describe the required procedures for application of the compensation schedule to an oil spill.

**WAC 173-185-210 On-Scene-Coordinator (OSC) Responsibilities.**

(1) The OSC shall determine:

- (a) identification of liable party
- (b) the quantity and type of oil spilled
- (c) the extent of the spill
- (d) the amount of oil cleaned up

(2) shall provide this information in a timely manner to the preassessment screening committee chair.

**WAC 173-185-220 Preassessment Screening Committee Responsibilities.**

(1) The preassessment screening chair shall determine in consultation with the OSC and preassessment screening committee:

- (a) the oil effects scores for the spilled oil as provided in WAC 173-000-080.
- (b) subregion(s) exposed to the spilled oil.
- (c) habitat types existing in subregions exposed to the spilled oil.
- (d) percent coverage of each habitat type in each subregion exposed to the spilled oil.
- (e) subregional habitat vulnerability scores for acute toxicity, mechanical injury and persistence as provided in WAC 173-000-090 and

(f) the most vulnerable season during which effects of the spill are expected to continue.

(2) Based on the determinations made by the preassessment screening committee chair described in WAC 173-185-210 and 220, the oil toxicity and the resource vulnerability scores for each subregion exposed to oil as provided in WAC 173-184, compensation for each spill incident applicable under WAC 173-183 to 185 shall be determined.

#### **WAC 173-185-230 Determination of Compensation**

(1) Compensation in each subregion is determined using three factors:

- (a) The number of gallons of oil spilled
- (b) The combined toxicity rating for acute toxicity, mechanical injury and persistence
- (c) individual resource vulnerability scores

(2) The following formula is used to determine the appropriate compensation:

Compensation (\$) =

$$\text{No. of gallons spilled} * \text{scaling factor} * \text{OIL}_i * (\text{HVS}_i + \text{BVS} + \text{MVS} + \text{FVS} + \text{RVS})$$

where OIL<sub>i</sub> = oil effects score

BVS = marine bird vulnerability score

MVS = marine mammal vulnerability score

FVS = fisheries species vulnerability score

RVS = recreation vulnerability score

HVS<sub>i</sub> = habitat vulnerability score

i = acute toxicity, mechanical injury and persistence

(note: scaling factor has yet to be determined)

(3) Where more than one subregion is exposed to spilled oil, compensation shall be calculated using resource vulnerability scores from the most sensitive subregion exposed to the spilled oil.

#### **173-185-300 Modification of Compensation Based on Actions Taken by Responsible Party.**

(1) The dollar amount of compensation calculated under WAC 173-185 shall be reduced under the following circumstances:

(a) In cases where spilled oil is recovered within 24 hours of the beginning of a spill, the number of gallons used in the compensation schedule formula shall be the number of gallons spilled minus the number of gallons recovered within 24 hours.

(b) In cases where the potentially liable party takes an action that results in successful protection of special habitat features including eelgrass beds, salt marshes, kelp beds, predesignated rare habitats, and other special features including seal and sea lion haulouts, national and state park

*Not  
a  
requirement*

and protected areas, herring spawning areas, salmon concentration areas, and seabird breeding colonies, the amount of compensation calculated under WAC 173-185-230 shall be reduced by the amount that the special feature contributed to the amount of compensation calculated.

(c) In cases where a potentially liable party acts to enhance detection of a spill, determination of the quantity of oil spilled, and/or extent of natural resource damages, the amount of compensation calculated under WAC 173-185-230 shall be reduced by 10%.

(2) In no case shall the modifications to compensation enumerated in subsection (1) of this section result in a reduction of compensation that is less than \$1 per gallon of oil spilled.

(3) The dollar amount of compensation calculated under WAC 173-185-230 shall be increased under the following circumstances:

(a) In cases where a potentially liable party impedes detection of the spill, determination of the number of gallons spilled, and/or extent of resource damages such as the unauthorized removal of evidence such as injured fish or wildlife, the amount of compensation calculated under WAC 173-185-230 shall be increased by 10%.

(b) In cases where the spiller or other potentially liable party takes an action that impedes detection of the spill, determination of the number of gallons spilled, or extent of resource injuries, the amount of savings that may have been realized by the taking the action shall be multiplied by 1.25 and added to the amount of compensation calculated in WAC 173-185-230.

(4) In no case shall the amount of compensation exceed \$50 per gallon of oil spilled.

#### **173-185-400 Appeal.**

Any person adversely affected by a decision of the department or the preassessment screening committee under this chapter may appeal such decision to the pollution control hearings board pursuant to chapter 43.21B RCW.

#### **173-185-500 Severability.**

If any provision of this rule or its application to any person or circumstance is held invalid, the remainder of the rule or application of the provision to other persons or circumstances is not affected.

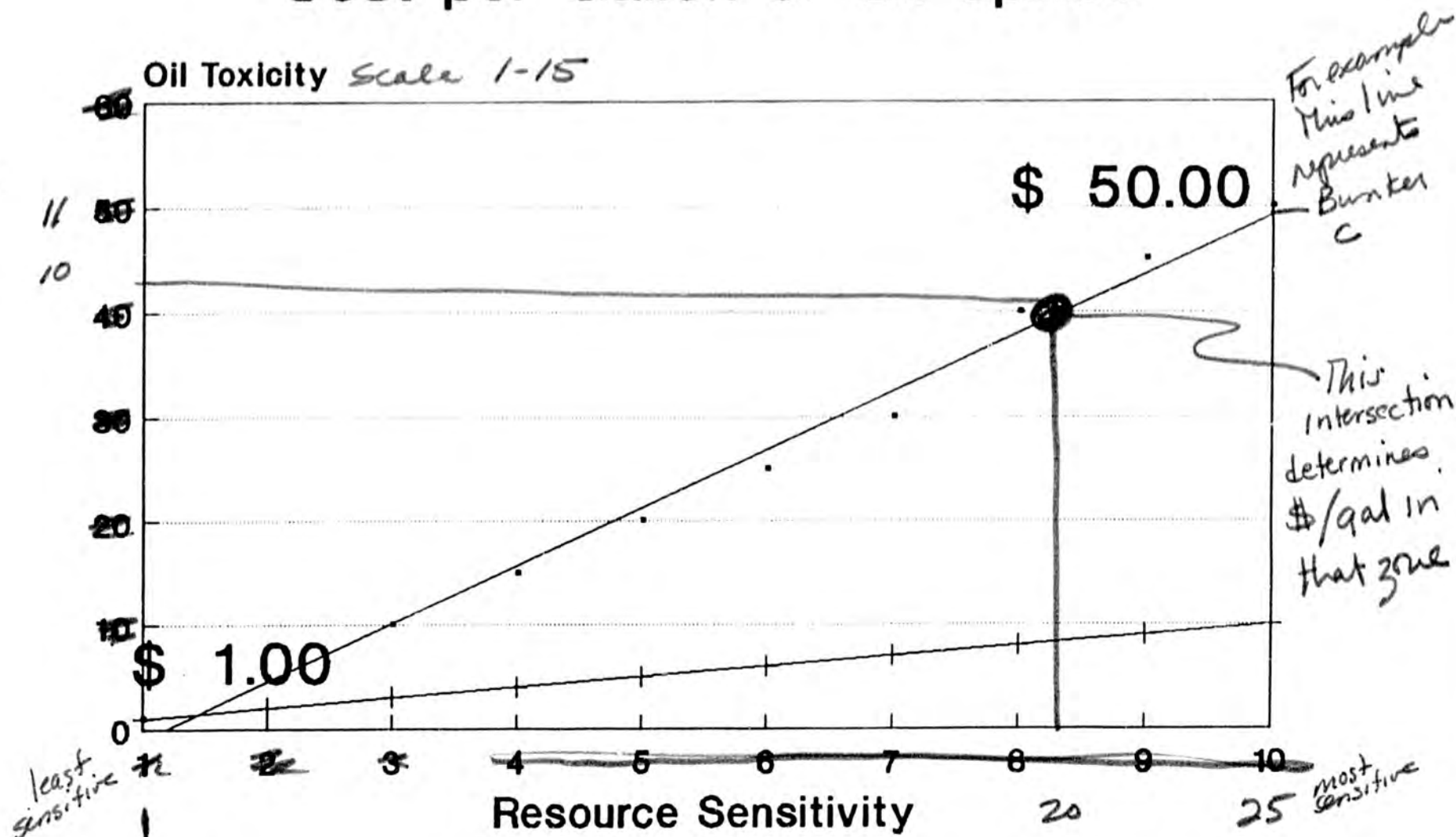
# 5 Table

We are limited to  
\$1-50/gal of oil spilled

This is done by 4  
seasons to account  
for population shifts  
and sensitivities i.e.  
spring more sensitive than  
Summer

# HYPOTHETICAL COMPENSATION TABLE

## Cost per Gallon of Oil Spilled



Source: Logan

Once dollar/gal determined we then factor in the action taken by resp. party that may have limited damage consequently lowering final \$/gal assessment.

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FACSIMILE TRANSMITTAL SHEET

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Here are  
The  
last  
pages

Fay - Here's the CHRIS reference  
plus info from SAX

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Doug T.

## A Guide to Using This Book

Tape this  
side

**SAX Number** - Entries are indexed in order by this alphanumeric code.

See *Introduction: paragraph 1, p. xix*

**CAS:** - The American Chemical Society's Chemical Abstracts Service number. A complete CAS number cross-index is located in Section 4, Vol. I.

See *Introduction: paragraph 4, p. xix*

**Entry Name** - A complete entry name and synonym cross-index is located in Section 5, Vol. I.

See *Introduction: paragraph 2, p. xix*

**DOT:** - The four digit hazard code assigned by the U.S. DOT.

See *Introduction: paragraph 6, p. xix*

**mf:** - the molecular formula

**mw:** - the molecular weight

See *Introduction: paragraphs*

*7 and 8, p. xx*

**PROP:** - Physical properties including solubility and flammability data. May contain a definition of the entry.

See *Introduction: paragraph 10, p. xx*

**SYNS:** - Synonyms for the entry. A complete synonym cross-index appears in Section 5, Vol. I.

See *Introduction: paragraph 11, p. xx*

**TOXICITY DATA:** - Data for skin and eye irritation, mutation, teratogenic, reproductive, carcinogenic, human, and acute lethal effects.

See *Introduction: paragraphs 12-16, pp. xx-xxix*

**Toxic and Hazard Reviews** - These are text summaries of the toxicity, fire, reactivity, incompatibilities, and other dangerous properties of the material.

See *Introduction: paragraph 20, p. xxxi*

## AMY500

## AMMONIA

CAS: 7664-41-7

DOT: 1005

mf: H<sub>3</sub>N mw: 17.04

HR: 3

NIOSH: BO 0875000

PROP: Colorless gas, extremely pungent odor, liquefied by compression. Mp: -77.7°, bp: -33.35°, lcl. 16%, ucl. 25%, d: 0.771 g/liter @ 0°, 0.817 g/liter @ -79°, autoign temp: 1204°F, vap press: 10 atm @ 25.7°, vap d: 0.6. Very sol in water, moderately sol in alc.

## SYNS:

AMMONIA ANHYDROUS

AMMONIAC (FRENCH)

AMMONIACA (ITALIAN)

AMMONIA GAS

AMMONIAK (GERMAN)

AMONIAK (POLISH)

SPIRIT OF KARTSHORN

## TOXICITY DATA:

mmo-esc 1500 ppm/3H

eye-rat-ih! 19800 µg/m<sup>3</sup>/16W

thi-hmn LCLo: 30000 ppm/5M

thi-hmn TCLo: 20 ppm/IRR

unk-man LDLo: 132 mg/kg

ori-rat LD50: 350 mg/kg

ini-rat LCLo: 2000 ppm/4H

thi-mus LD50: 4837 ppm/1H

thi-cat LCLo: 7000 ppm/1H

thi-cat TCLo: 1000 ppm/10M

thi-rbt LCLo: 7000 ppm/1H

thi-mam LCLo: 5000 ppm/5M

## CODEN:

AMNTA4 85,119,51

BZARAZ 27,102,74

TJSGA8 45,458,67

AGGHAR 13,528,55

85DCA1 2,73,70

PHIT\*\*

JHTAB 31,343,49

NTIS\*\* PB214-270

JHTAB 26,29,44

AEHLAU 35,6,80

JHTAB 26,29,44

AEPPE 138,65,28

EPA Extremely Hazardous Substances List. Community Right To Know List. Reported in EPA TSCA Inventory.

OSHA PEL: TWA 50 ppm

ACGIH TLV: TWA 25 ppm; STEL 35 ppm

DFG MAK: 50 ppm (35 mg/m<sup>3</sup>)

NIOSH REL: CL 50 ppm

DOT Classification: Nonflammable Gas, Label: Nonflammable Gas

THR: A human poison by an unspecified route. Poison experimentally by inhalation, ingestion, and possibly other routes. An eye, mucous membrane, and systemic irritant by inhalation. Mutagenic data. A common air contaminant. Difficult to ignite. Explosion hazard when exposed to flame or in a fire. NH<sub>3</sub> + air in a fire can detonate. Potentially violent or explosive reactions on contact with interhalogens (e.g., bromine pentafluoride; chlorine trifluoride); 1,2-dichloroethane (with liquid NH<sub>3</sub>); boron halides; chloroformamidinium nitrate; ethylene oxide (polymerization reaction); magnesium perchlorate; nitrogen trichloride; oxygen + platinum; or strong oxidants (e.g., potassium chlorate; nitryl chloride; chromyl chloride; dichlorine oxide; chromium trioxide; nitrogen dioxide; nitric acid; hydrogen peroxide; tetramethylammonium amide; thiocarbonyl azide; thiocyanate; sulfinyl chloride; thiotriazyl chloride; ammonium peroxodisulfate; fluorine; nitrogen oxide; dinitrogen trioxide; and liquid oxygen). Forms sensitive explosive

mixtures with air + hydrocarbons; 1-chloro-2,4-dinitrobenzene; 2- or 4-chloronitrobenzene (above 160°C/30 bar); ethanol + silver nitrate; germanium derivatives; stibine; and chlorine. Reaction with silver chloride; silver nitrate; silver azide; and silver oxide form the explosive silver nitride. Reactions with chlorine azide; bromine; iodine; iodine + potassium; heavy metals and their compounds (e.g. gold(III) chloride; mercury; and potassium thallium amide ammoniate); tellurium halides (e.g., tellurium tetrabromide; and tellurium tetrachloride) and pentaborane(9) give explosive products. Incompatible in contact with Ag; acetaldehyde; acrolein; B; BI<sub>3</sub>; halogens; HClO<sub>3</sub>; ClO; chlorites; chlorosilane; (ethylene dichloride + liquid ammonia); Au; hexachloromelamine; (hydrazine + alkali metals); HBr; HOCl; Mg(ClO<sub>4</sub>)<sub>2</sub>; N<sub>2</sub>O<sub>4</sub>; NCl<sub>3</sub>; NF<sub>3</sub>; OF<sub>2</sub>; P<sub>2</sub>O<sub>5</sub>; P<sub>2</sub>O<sub>3</sub>; picric acid; (K + AsH<sub>3</sub>); (K + PH<sub>3</sub>); (K + NaNO<sub>2</sub>); potassium ferricyanide; potassium mercuric cyanide; (Na + CO); Sb; S; SCl<sub>2</sub>; tellurium hydropentachloride; trichloromelamine; NO<sub>2</sub>Cl; SbH<sub>3</sub>; tetramethylammonium amide; SOCl<sub>2</sub>; thiotriazylchloride. Incandescent reaction when heated with calcium. Emits toxic fumes of NH<sub>3</sub> and NO<sub>x</sub> when exposed to heat. Stop flow of gas to fight fire. For further information, see Vol. 3, No. 3 of *DPIM Report*.

## AMZ125

## 2-AMMONIOTHIAZOLE NITRATE

CAS: 57530-25-2

mf: C<sub>3</sub>H<sub>3</sub>N<sub>3</sub>O<sub>3</sub>S mw: 163.15

HR: 2

THR: Explosive decomposition at 142°C. Upon decomposition it emits toxic fumes of SO<sub>x</sub> and NO<sub>x</sub>.

## ANA000

## AMMONIUM ACETATE

CAS: 631-61-8

DOT: 9079

mf: C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>•H<sub>3</sub>N mw: 77.10

NIOSH: AF 3675000

HR: 3

PROP: Crystals. Mp: 114°, d: 1.07.

SYN: ACETIC ACID, AMMONIUM SALT

## TOXICITY DATA:

ivn-mus LD50: 386 mg/kg

ipr-rat LD50: 632 mg/kg

ivn-mus LD50: 98 mg/kg

ipr-ckn LDLo: 1735 mg/kg

## CODEN:

MEIEDD 10,74,83

ABBIA4 64,342,56

12VXA5 8,65,68

BUOAK 106,699,68

Reported in EPA TSCA Inventory.

DOT Classification: ORM-E; Label: None

THR: Poison by intravenous route. Moderately toxic by intraperitoneal routes. When heated to decomposition it emits toxic fumes of NO<sub>x</sub> and NH<sub>3</sub>. For further information, see Vol. 2, No. 3 of *DPIM Report*.

## ANA250

AMMONIUM *aci*-NITROMETHANEmf: CH<sub>3</sub>O<sub>2</sub>N<sub>2</sub> mw: 79.1

HR: 3

U.S. Department  
of Transportation  
United States  
Coast Guard



# CHRIS

## *Hazardous Chemical Data*



COMMANDANT INSTRUCTION M-16465-12A



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

MAILING ADDRESS  
Commandant (G-WER-2)  
U. S. Coast Guard  
Washington, DC 20593  
Phone: (202) 426-9568

COMDTINST M16465.12A ✓

14 NOV 1994

COMMANDANT INSTRUCTION M16465.12A

Subj: Volume II of the Chemical Hazard Response Information System (CHRIS)

1. PURPOSE. This Instruction promulgates the subject manual.
  2. DIRECTIVES AFFECTED. COMDTINST M16465.12 of 11 Sep 1978 is cancelled.
  3. DISCUSSION. The new edition of CHRIS Manual II contains all changes and updates to the previous manual. Several new data fields have been added. The updated Threshold Limit Values (TLV) and Immediately Dangerous to Life and Health (IDLH) values are in accordance with the latest available information.
2. ACTION.
- a. Units involved in the Marine Environmental Response mission of the Coast Guard shall incorporate this manual into their response program.
  - b. Personnel noting any errors in the manual should submit them, via rapidraft, to:

Commandant (G-WER-2)  
U.S. Coast Guard  
Washington, DC 20593  
ATTN: CHRIS Update

*J. W. Kime*  
J. W. KIME  
Chief, Office of Marine  
Environment and Systems

Encl: (1) Volume II, Chemical Hazard Response Information System (CHRIS)

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# **Dangerous Properties of Industrial Materials**

**Seventh Edition**

**Volume II**

**N. IRVING SAX**

**and**

**RICHARD J. LEWIS, SR.**



**VAN NOSTRAND REINHOLD**  
NEW YORK

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EXAMPLE

— CBV500  
— CARBON DISULFIDE  
— CAS: 75-15-0  
— DOT: 1131  
— mf: CS<sub>2</sub> mw: 76.13

HR: 3  
NIOSH: PP 6650000

— PROP: Clear, colorless liquid; nearly odorless when pure.  
Mp: -110.8°, bp: 46.5°, d: 1.3%, vol: 20%, flash p:  
-22°F (CC), d: 1.261 @ 20°/20°, autoign temp: 257°F,  
vap press: 400 mm @ 28°, vap d: 2.64.

— SYNS:  
CARBON DISULFIDE (DOT)  
CARBON DISULFIDE

CARBON SULFIDE  
CARBON SULFIDE (DOT)

— TOXICITY DATA:  
mno-lat: 100 µL/plat  
sce-hmn: 10200 µg/L  
lhl-man TCLO: 40 mg/m<sup>3</sup> (91W  
male): REP  
ori-rat TDLo: 2 g/kg (6-15D  
preg): TER  
lhl-rat TCLO: 200 mg/m<sup>3</sup>/24H  
(1-21D preg): REP  
ori-rat LDLo: 14 mg/kg  
lhl-hmn LCLo: 4000 ppm/30M  
lhl-hmn LCLo: 2000 ppm/5M  
unr-man LDLo: 186 mg/kg  
ori-rat LD50: 3188 mg/kg  
ori-mus LD50: 2780 mg/kg  
ori-rat LD50: 2550 mg/kg  
ori-gpg LD50: 2125 mg/kg  
lhl-man LCLo: 2000 ppm/5M

CODEN:  
NIOSH: 141177  
BCTKAG: 14115.81  
MELAAD: 60566.69  
TOXID: 4.85.84  
KHZDAN: 21257.78  
32ZWAA: 3225.74  
29ZWAE: 318.68  
TABIA2: 3231.33  
85DCAI: 273.70  
GISAAA: 31(1), 13.66  
GISAAA: 31(1), 13.66  
GISAAA: 31(1), 13.66  
GISAAA: 31(1), 13.66  
AEPPAE: 138.65.28

Reported in EPA TSCA Inventory. EPA Genetic Toxicol-  
ogy Program. Community Right To Know List. EPA Ex-  
tremely Hazardous Substances List.

OSHA PEL: TWA 20 ppm; CL 30 ppm; Pk 100 ppm/  
30M/8H

ACGIH TLV: TWA 10 ppm (skin)

DFG MAK: 10 ppm (30 mg/m<sup>3</sup>)

NIOSH REL: TWA 1 ppm; CL 10 ppm/15M

DOT Classification: Flammable Liquid, Label: Flammable  
Liquid; IMO: Flammable Liquid; Label: Flammable Liq-  
uid, Poison

THR: A human poison by ingestion and possibly other  
routes. Mildly toxic to humans by inhalation. An experi-  
mental poison by intraperitoneal route. Human reproductive  
effects on spermatogenesis by inhalation. An experimental  
teratogen. Other experimental reproductive effects. Human  
mutagenic data. The main toxic effect is on the central  
nervous system, acting as a narcotic and anesthetic in acute  
poisoning with death following from respiratory failure.

Aluminum powder ignites in CS<sub>2</sub> vapor. The vapor ignites  
on contact with fluorine. Reacts violently with azides; CsN<sub>3</sub>;  
ClO; ethylamine diamine; ethylene imine; Pb(N<sub>3</sub>)<sub>2</sub>; LiN<sub>3</sub>;  
(H<sub>2</sub>SO<sub>4</sub> + permanganates); KN<sub>3</sub>; RbN<sub>3</sub>; NaN<sub>3</sub>; phenylcop-  
per-triphenylphosphine complexes. Incompatible with air;  
metals; oxidants. To fight fire, use water, CO<sub>2</sub>, dry chemi-  
cal, fog, mist. When heated to decomposition it emits highly  
toxic fumes of SO<sub>2</sub>. For further information, see Vol. 3,  
No. 5 of DPIM Report.

HR: - Hazard rating indicating relative  
hazard for toxicity, fire, and reactivity  
with 3 denoting the worst hazard level.  
See Introduction: paragraph 3, p. xix

NIOSH: - The National Institute for  
Occupational Safety and Health's  
Registry of Toxic Effects of Chemical  
Substances accession number.  
See Introduction: paragraph 5, p. xix

CODEN: - A code which represents  
the cited reference for the toxicity data.  
Complete bibliographic citations in  
CODEN order are listed Section 6, Vol. 1.  
See Introduction: paragraph 17, p. xxix

Reviews and Status - Here are listed  
IARC carcinogenic evaluations, NTP  
carcinogenic test status, EPA Extremely  
Hazardous Substances List, EPA  
Community Right To Know List, EPA  
Genetic Toxicology Program. (GENE-  
TOX), and EPA TSCA status lines.  
See Introduction: paragraph 18, p. xxx

Standards and Recommendations -  
Here are listed the OSHA PEL, ACGIH  
TLV, DFG MAK, and NIOSH REL  
workplace air levels. U.S. DOT  
Classification and labels are also listed.  
See Introduction: paragraph 19, p. xxx

Note: For complete entry on Carbon Disulfide see pp. 711-712.

[illegible][illegible]

AMA

## AMMONIA, anhydrous

| 12.17<br>SATURATED LIQUID DENSITY |                          | 12.18<br>LIQUID HEAT CAPACITY |                                     | 12.19<br>LIQUID THERMAL CONDUCTIVITY |                                                         | 12.20<br>LIQUID VISCOSITY  |                                                  |
|-----------------------------------|--------------------------|-------------------------------|-------------------------------------|--------------------------------------|---------------------------------------------------------|----------------------------|--------------------------------------------------|
| Temperature<br>(degrees F)        | Pounds per cubic<br>foot | Temperature<br>(degrees F)    | British thermal unit<br>per pound-F | Temperature<br>(degrees F)           | British thermal<br>unit-inch per hour-<br>square foot-F | Temperature<br>(degrees F) | Centipoise                                       |
| -108                              | 42.070                   | -78                           | 1.041                               |                                      | NOT<br>P<br>E<br>R<br>T<br>I<br>N<br>E<br>N<br>T        |                            | NOT<br>P<br>E<br>R<br>T<br>I<br>N<br>E<br>N<br>T |
| -100                              | 42.200                   | -70                           | 1.043                               |                                      |                                                         |                            |                                                  |
| -98                               | 42.310                   | -68                           | 1.046                               |                                      |                                                         |                            |                                                  |
| -90                               | 42.410                   | -60                           | 1.049                               |                                      |                                                         |                            |                                                  |
| -85                               | 42.500                   | -55                           | 1.052                               |                                      |                                                         |                            |                                                  |
| -80                               | 42.570                   | -50                           | 1.054                               |                                      |                                                         |                            |                                                  |
| -78                               | 42.630                   | -48                           | 1.057                               |                                      |                                                         |                            |                                                  |
| -70                               | 42.680                   | -40                           | 1.060                               |                                      |                                                         |                            |                                                  |
| -65                               | 42.720                   | -35                           | 1.063                               |                                      |                                                         |                            |                                                  |
| -60                               | 42.740                   | -30                           | 1.066                               |                                      |                                                         |                            |                                                  |
| -55                               | 42.750                   |                               |                                     |                                      |                                                         |                            |                                                  |
| -50                               | 42.750                   |                               |                                     |                                      |                                                         |                            |                                                  |
| -45                               | 42.730                   |                               |                                     |                                      |                                                         |                            |                                                  |
| -40                               | 42.700                   |                               |                                     |                                      |                                                         |                            |                                                  |
| -35                               | 42.660                   |                               |                                     |                                      |                                                         |                            |                                                  |
| -30                               | 42.600                   |                               |                                     |                                      |                                                         |                            |                                                  |

| 12.21<br>SOLUBILITY IN WATER         |                                   | 12.22<br>SATURATED VAPOR PRESSURE |                           | 12.23<br>SATURATED VAPOR DENSITY |                          | 12.24<br>IDEAL GAS HEAT CAPACITY |                                     |
|--------------------------------------|-----------------------------------|-----------------------------------|---------------------------|----------------------------------|--------------------------|----------------------------------|-------------------------------------|
| Temperature<br>(degrees F)           | Pounds per 100<br>pounds of water | Temperature<br>(degrees F)        | Pounds per square<br>inch | Temperature<br>(degrees F)       | Pounds per cubic<br>foot | Temperature<br>(degrees F)       | British thermal unit<br>per pound-F |
| M<br>I<br>S<br>C<br>I<br>B<br>L<br>E |                                   | -40                               | 10.470                    | -40                              | .03857                   | 0                                | .487                                |
|                                      |                                   | -35                               | 12.080                    | -35                              | .04514                   | 25                               | .484                                |
|                                      |                                   | -30                               | 13.900                    | -30                              | .05102                   | 50                               | .501                                |
|                                      |                                   | -25                               | 15.840                    | -25                              | .05818                   | 75                               | .508                                |
|                                      |                                   | -20                               | 18.220                    | -20                              | .06573                   | 100                              | .515                                |
|                                      |                                   | -15                               | 20.750                    | -15                              | .07408                   | 125                              | .523                                |
|                                      |                                   | -10                               | 23.590                    | -10                              | .08322                   | 150                              | .530                                |
|                                      |                                   | -5                                | 26.730                    | -5                               | .09326                   | 175                              | .538                                |
|                                      |                                   | 0                                 | 30.210                    | 0                                | .10420                   | 200                              | .546                                |
|                                      |                                   | 5                                 | 34.040                    | 5                                | .11620                   | 225                              | .554                                |
|                                      |                                   | 10                                | 38.270                    | 10                               | .12930                   | 250                              | .562                                |
|                                      |                                   | 15                                | 42.920                    | 15                               | .14340                   | 275                              | .571                                |
|                                      |                                   | 20                                | 48.020                    | 20                               | .15860                   | 300                              | .579                                |
|                                      |                                   | 25                                | 53.600                    | 25                               | .17540                   | 325                              | .588                                |
|                                      |                                   | 30                                | 59.690                    | 30                               | .19340                   | 350                              | .597                                |
|                                      |                                   | 35                                | 66.330                    | 35                               | .21270                   | 375                              | .606                                |
|                                      |                                   | 40                                | 73.549                    | 40                               | .23350                   | 400                              | .615                                |
|                                      |                                   | 45                                | 81.400                    | 45                               | .25590                   | 425                              | .625                                |
|                                      |                                   | 50                                | 89.900                    | 50                               | .27980                   | 450                              | .635                                |
|                                      |                                   | 55                                | 98.099                    | 55                               | .30560                   | 475                              | .645                                |
|                                      |                                   | 60                                | 108.000                   | 60                               | .33290                   | 500                              | .655                                |
|                                      |                                   | 65                                | 119.700                   | 65                               | .36210                   | 525                              | .665                                |
|                                      |                                   | 70                                | 131.299                   | 70                               | .39320                   | 550                              | .675                                |
|                                      |                                   | 75                                | 143.699                   | 75                               | .42630                   | 575                              | .686                                |
|                                      |                                   | 80                                | 157.000                   | 80                               | .46150                   | 600                              | .697                                |
|                                      |                                   | 85                                | 171.199                   | 85                               | .49870                   |                                  |                                     |

| Wetland Type | Colonies | Arthropod Data |
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| Wetland Type | Colonies | Arthropod Data |

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## AMMONIUM HYDROXIDE

| 12.17<br>SATURATED LIQUID DENSITY |                          | 12.18<br>LIQUID HEAT CAPACITY |                                     | 12.19<br>LIQUID THERMAL CONDUCTIVITY |                                                              | 12.20<br>LIQUID VISCOSITY  |                                                              |
|-----------------------------------|--------------------------|-------------------------------|-------------------------------------|--------------------------------------|--------------------------------------------------------------|----------------------------|--------------------------------------------------------------|
| Temperature<br>(degrees F)        | Pounds per cubic<br>foot | Temperature<br>(degrees F)    | British thermal unit<br>per pound-F | Temperature<br>(degrees F)           | British thermal<br>unit-inch per hour-<br>square foot-F      | Temperature<br>(degrees F) | Centipoise                                                   |
| 10                                | 56.640                   | 34                            | 1.000                               |                                      | N<br>O<br>T<br><br>P<br>E<br>R<br>T<br>I<br>N<br>E<br>N<br>T |                            | N<br>O<br>T<br><br>P<br>E<br>R<br>T<br>I<br>N<br>E<br>N<br>T |
| 15                                | 56.630                   | 36                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 20                                | 56.430                   | 38                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 25                                | 56.330                   | 40                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 30                                | 56.220                   | 42                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 35                                | 56.120                   | 44                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 40                                | 56.010                   | 46                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 45                                | 55.910                   | 48                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 50                                | 55.810                   | 50                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 55                                | 55.700                   | 52                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 60                                | 55.600                   | 54                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 65                                | 55.490                   | 56                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 70                                | 55.380                   | 58                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 75                                | 55.290                   | 60                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 80                                | 55.180                   | 62                            | 1.000                               |                                      |                                                              |                            |                                                              |
| 85                                | 55.080                   | 64                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 66                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 68                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 70                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 72                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 74                            | 1.000                               |                                      |                                                              |                            |                                                              |
|                                   |                          | 76                            | 1.000                               |                                      |                                                              |                            |                                                              |

| 12.21<br>SOLUBILITY IN WATER |                                      | 12.22<br>SATURATED VAPOR PRESSURE |                                                                                      | 12.23<br>SATURATED VAPOR DENSITY |                                                                                      | 12.24<br>IDEAL GAS HEAT CAPACITY |                                                              |
|------------------------------|--------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------|
| Temperature<br>(degrees F)   | Pounds per 100<br>pounds of water    | Temperature<br>(degrees F)        | Pounds per<br>square inch                                                            | Temperature<br>(degrees F)       | Pounds per cubic<br>foot                                                             | Temperature<br>(degrees F)       | British thermal unit<br>per pound-F                          |
|                              | M<br>I<br>S<br>C<br>I<br>B<br>L<br>E |                                   | D<br>A<br>T<br>A<br><br>N<br>O<br>T<br><br>A<br>V<br>A<br>I<br>L<br>A<br>B<br>L<br>E |                                  | D<br>A<br>T<br>A<br><br>N<br>O<br>T<br><br>A<br>V<br>A<br>I<br>L<br>A<br>B<br>L<br>E |                                  | N<br>O<br>T<br><br>P<br>E<br>R<br>T<br>I<br>N<br>E<br>N<br>T |

## FACSIMILE TRANSMITTAL SHEET

## DEPARTMENT OF ENVIRONMENTAL CONSERVATION

*Environmental Quality - Director's Office*

Hazardous and Solid Waste Management

*3220 Hospital Drive**P.O. Box 'O'**Juneau, Alaska 99811-1800*

Telephone #: (907) 465-2671

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*Anchorage Office #1: 362-4026 JCO & EH - Juneau #1: 463-3366**Seldovia Office #1: 262-2294 Fairbanks Office #1: 451-6130**Southeast Office #1: 789-4877 Valdez Office #1: 835-8103**To: Ginny Fay**3/1/91**Attn: Sen Cotton's Office**To #: 465 4979**From: DOUG TOLAND, ADEC Haz Waste Program**Total of Pages: Including Cover Sheet: 5**Fay -*

*Comments: Please call if you have  
any questions or need clarification.  
The print is small and may not  
fax well.*

*Doug T.*

under 42 USCS § 9607,  
necessary and consistent  
plan: (1) surface  
ation; (2) multilayered  
wall; (4) internal with-  
internal withdrawal well  
(6) groundwater moni-  
operation and mainte-  
*States v Conservation*  
*Mo*) 628 F Supp 391,  
preceding (WD Mo) 653  
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*el. & Tel. Co. v Cha-*  
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daining ripeness of city's  
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Act of 1980, 42 USCS  
generators of industrial  
which city alleges consti-  
tutes" under § 9601(14),  
legally disposed of wastes  
costs of collecting and  
samples, and conducting  
air quality monitoring,  
on study, are within  
costs, under § 9601(23),  
tion of "response" costs  
is sufficient to establish  
the costs at affected sites.  
(1986, SD NY) 653 F  
later proceeding (SD  
11371.

n scope of term "state"  
ve Environmental Re-  
nd Liability Act (42  
ongress entrusted with  
cost for cleanup under  
to sue for damages for  
or less of natural re-  
(C). Mayor & Bd. of  
ical Corp. (1985, DC  
LR 20328.

hip" defense of 42 USCS ) is not available to oil ailed to present specific e other par y having no contractual connect- ely responsible for re- tances found on subject ised due care or took roperty from becoming e. Washington v Time 687 F Supp 529.

**§ 9602. Designation of additional hazardous substances and establishment of reportable released quantities; regulations**

(a) The Administrator shall promulgate and revise as may be appropriate, regulations designating as hazardous substances, in addition to those referred to in section 101(14) of this title [42 USCS § 9601(14)], such elements, compounds, mixtures, solutions, and substances which, when released into the environment may present substantial danger to the public health or welfare or the environment, and shall promulgate regulations establishing that quantity of any hazardous substance the release of which shall be reported pursuant to section 103 of this title [42 USCS § 9603]. The Administrator may determine that one single quantity shall be the reportable quantity for any hazardous substance, regardless of the medium into which the hazardous substance is released. For all hazardous substances for which proposed regulations establishing reportable quantities were published in the Federal Register under this subsection on or before March 1, 1986, the Administrator shall promulgate under this subsection final regulations establishing reportable quantities not later than December 31, 1986. For all hazardous substances for which proposed regulations establishing reportable quantities were not published in the Federal Register under this subsection on or before March 1, 1986, the Administrator shall publish under this subsection proposed regulations establishing reportable quantities not later than December 31, 1986, and promulgate final regulations under this subsection establishing reportable quantities not later than April 30, 1988.

(b) Unless and until superseded by regulations establishing a reportable quantity under subsection (a) of this section for any hazardous substance as defined in section 101(14) of this title [42 USCS § 9601(14)], (1) a quantity of one pound, or (2) for those hazardous substances for which reportable quantities have been established pursuant to section 311(b)(4) of the Federal Water Pollution Control Act [42 USCS § 1321(b)(4)], such reportable quantity, shall be deemed that quantity, the release of which requires notification pursuant to section 103(a) or (b) of this title [42 USCS § 9603(a) or (b)].

(Dec. 11, 1980, P. L. 96-510, Title I, § 102, 94 Stat. 2772; Oct. 17, 1986, P. L. 99-499, Title I, § 102, 100 Stat. 1617.)

**Effective date of section:**

Act Dec. 11, 1980, P. L. 96-510, Title III, § 302(a), 94 Stat. 2808, which appears as 42 USCS § 9652(a), provides that this section shall become effective upon its enactment on Dec. 11, 1980.

**Amendments:**

1986. Act Oct. 17, 1986 (effective on enactment on 10/17/86, as provided by § 4 of such Act, which appears as 42 USCS § 9601 note), in subsec. (a), inserted the two sentences which begin "For all hazard-

ous substances for which proposed regulations establishing reportable quantities . . . .".

### CODE OF FEDERAL REGULATIONS

Designation, reportable quantities, and notification, 40 CFR Part 302.

### RESEARCH GUIDE

**Federal Procedure L Ed:**

11 Fed Proc, L Ed, Environmental Protection § 32:1034.

### INTERPRETIVE NOTES AND DECISIONS

In action against alleged generator of hazardous waste, under 42 USCS § 9607, what government must prove to establish that defendant's wastes are hazardous is that waste contains unspecified quantity of substances designated as hazardous or toxic under statutes specified in definition of "hazardous substance" under 42 USCS § 9601. *United States v Wade* (1983, ED Pa) 577 F Supp 1326, 14 ELR 20096, motion den, in part, motion gr, in part (ED Pa) 14 ELR 20435, summary judgment den (ED Pa) 14 ELR 20436, later proceeding (ED Pa) 14 ELR 20437, motion den, in part, motion gr, in part (ED Pa) 14 ELR 20439, later proceeding (ED Pa) 14 ELR 20440, motion den (ED Pa) 14 ELR 20441, later proceeding (ED Pa) 677 F Supp 342, and later proceeding (ED Pa) 653 F Supp 11.

In city's action under Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 USCS § 9607(a)(4)(B), against generators of industrial and chemical wastes, which city alleges consti-

tute "hazardous substances" under CERCLA, and oil refiners that illegally disposed of wastes in city landfill sites, precise chemical nature of wastes is to be addressed after discovery, since question of wastes' constituents is hotly disputed. *New York v Exxon Corp.* (1986, SD NY) 633 F Supp 609, 16 ELR 20850, later proceeding (SD NY) 1988 US Dist LEXIS 11371.

City has burden, in action under Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) 42 USCS § 9607(a)(4)(B), against generators of industrial and chemical wastes, and oil refiners that illegally disposed of wastes in city landfill sites, to prove that wastes contained "hazardous substances" under § 9601(14), as identified in EPA regulations under § 9602(a) or § 9603, or other federal statutes, and that substances' presence caused or would cause city to incur response costs. *New York v Exxon Corp.* (1986, SD NY) 633 F Supp 609, 16 ELR 20850, later proceeding (SD NY) 1988 US Dist LEXIS 11371.

### § 9603. Notification requirements respecting released substances

(a) **Notice to National Response Center upon release from vessel or offshore or onshore facility by person in charge; conveyance of notice by Center.** Any person in charge of a vessel or an offshore or an onshore facility shall, as soon as he has knowledge of any release (other than a federally permitted release) of a hazardous substance from such vessel or facility in quantities equal to or greater than those determined pursuant to section 102 of this title [42 USCS § 9602], immediately notify the National Response Center established under the Clean Water Act [33 USCS §§ 1251 et seq.] of such release. The National Response Center shall convey the notification expeditiously to all appropriate Government agencies, including the Governor of any affected State.

(b) **Penalties for failure to notify; use of notice or information pursuant to notice in criminal case.** Any person—

(1) in charge of a vessel from which a hazardous substance is released, other than a federally permitted release, into or upon the navigable

(4) regulating the treatment, storage, transportation, and disposal of hazardous wastes which have adverse effects on health and the environment;

(5) providing for the promulgation of guidelines for solid waste collection, transport, separation, recovery, and disposal practices and systems;

(6) promoting a national research and development program for improved solid waste management and resource conservation techniques, more effective organizational arrangements, and new and improved methods of collection, separation, and recovery, and recycling of solid wastes and environmentally safe disposal of nonrecoverable residues;

(7) promoting the demonstration, construction, and application of solid waste management, resource recovery, and resource conservation systems which preserve and enhance the quality of air, water, and land resources; and

(8) establishing a cooperative effort among the Federal, State, and local governments and private enterprise in order to recover valuable materials and energy from solid waste.

(Oct. 20, 1965, P. L. 89-272, Title II, Subtitle A, § 1003, as added Oct. 21, 1976, P. L. 94-580, § 2, 90 Stat. 2798.)

#### HISTORY; ANCILLARY LAWS AND DIRECTIVES

##### Explanatory notes:

Similar provisions were contained in 42 USCS § 3251 prior to general revision of the Act of Oct. 20, 1965, P. L. 89-272 by Act Oct. 21, 1976, P. L. 94-580, 90 Stat. 2795.

#### RESEARCH GUIDE

##### Am Jur:

16 Am Jur 2d, Constitutional Law §§ 290, 292.

61A Am Jur 2d, Pollution Control §§ 7, 9, 146, 265, 274.

#### § 6903. Definitions

As used in this Act [42 USCS §§ 6901 et seq.]:

(1) The term "Administrator" means the Administrator of the Environmental Protection Agency.

(2) The term "construction," with respect to any project of construction under this Act [42 USCS §§ 6901 et seq.], means (A) the erection or building of new structures and acquisition of lands or interests therein, or the acquisition, replacement, expansion, remodeling, alteration, modernization, or extension of existing structures, and (B) the acquisition and installation of initial equipment of, or required in connection with, new or newly acquired structures or the expanded, remodeled, altered, modernized or extended part of existing structures (including trucks and other motor vehicles, and tractors, cranes, and other machinery) neces-

sary for the proper utilization and operation of the facility after completion of the project; and includes preliminary planning to determine the economic and engineering feasibility and the public health and safety aspects of the project, the engineering, architectural, legal, fiscal, and economic investigations and studies, and any surveys, designs, plans, working drawings, specifications, and other action necessary for the carrying out of the project, and (C) the inspection and supervision of the process of carrying out the project to completion.

(2A) The term "demonstration" means the initial exhibition of a new technology process or practice or a significantly new combination or use of technologies, processes or practices, subsequent to the development stage, for the purpose of proving technological feasibility and cost effectiveness.

(3) The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

(4) The term "Federal agency" means any department, agency, or other instrumentality of the Federal Government, any independent agency or establishment of the Federal Government including any Government corporation, and the Government Printing Office.

(5) The term "hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may—

(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

(B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

(6) The term "hazardous waste generation" means the act or process of producing hazardous waste.

(7) The term "hazardous waste management" means the systematic control of the collection, source separation, storage, transportation, processing, treatment, recovery, and disposal of hazardous wastes.

(8) For purposes of Federal financial assistance (other than rural communities assistance), the term "implementation" does not include the acquisition, leasing, construction, or modification of facilities or equipment or the acquisition, leasing, or improvement of land[.]

(9) The term "intermunicipal agency" means an agency established by two or more municipalities with responsibility for planning or administration of solid waste.

(10) The term "interstate agency" means an agency of two or more municipalities in different States, or an agency established by two or

more States, with authority to provide for the management of solid wastes and serving two or more municipalities located in different States.

(11) The term "long-term contract" means, when used in relation to solid waste supply, a contract of sufficient duration to assure the viability of a resource recovery facility (to the extent that such viability depends upon solid waste supply).

(12) The term "manifest" means the form used for identifying the quantity, composition, and the origin, routing, and destination of hazardous waste during its transportation from the point of generation to the point of disposal, treatment, or storage.

(13) The term "municipality" (A) means a city, town, borough, county, parish, district, or other public body created by or pursuant to State law, with responsibility for the planning or administration of solid waste management, or an Indian tribe or authorized tribal organization or Alaska Native village or organization, and (B) includes any rural community or unincorporated town or village or any other public entity for which an application for assistance is made by a State or political subdivision thereof.

(14) The term "open dump" means any facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 [42 USCS § 6944] and which is not a facility for disposal of hazardous waste.

(15) The term "person" means an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, or any interstate body.

(16) The term "procurement item" means any device, good, substance, material, product, or other item whether real or personal property which is the subject of any purchase, barter, or other exchange made to procure such item.

(17) The term "procuring agency" means any Federal agency, or any State agency or agency of a political subdivision of a State which is using appropriated Federal funds for such procurement, or any person contracting with any such agency with respect to work performed under such contract.

(18) The term "recoverable" refers to the capability and likelihood of being recovered from solid waste for a commercial or industrial use.

(19) The term "recovered material" means waste material and byproducts which have been recovered or diverted from solid waste, but such term does not include those materials and byproducts generated from, and commonly reused within, an original manufacturing process.

(20) The term "recovered resources" means material or energy recovered from solid waste.

(21) The term "resource conservation" means reduction of the amounts of solid waste that are generated, reduction of overall resource consumption, and utilization of recovered resources.

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(22) The term "resource recovery" means the recovery of material or energy from solid waste.

(23) The term "resource recovery system" means a solid waste management system which provides for collection, separation, recycling, and recovery of solid wastes, including disposal of nonrecoverable waste residues.

(24) The term "resource recovery facility" means any facility at which solid waste is processed for the purpose of extracting, converting to energy, or otherwise separating and preparing solid waste for reuse.

(25) The term "regional authority" means the authority established or designated under section 4006 [42 USCS § 6946].

(26) The term "sanitary landfill" means a facility for the disposal of solid waste which meets the criteria published under section 4004 [42 USCS § 6944].

(26A) The term "sludge" means any solid, semisolid or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effects.

(27) The term "solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880) [33 USCS § 1342], or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) [42 USCS §§ 2011 et seq.].

(28) The term "solid waste management" means the systematic administration of activities which provide for the collection, source separation, storage, transportation, transfer, processing, treatment, and disposal of solid waste.

(29) The term "solid waste management facility" includes—

(A) any resource recovery system or component thereof,

(B) any system, program, or facility for resource conservation, and

(C) any facility for the collection, source separation, storage, transportation, transfer, processing, treatment or disposal of solid wastes, including hazardous wastes, whether such facility is associated with facilities generating such wastes or otherwise.

(30) The terms "solid waste planning", "solid waste management", and "comprehensive planning" include planning or management respecting resource recovery and resource conservation.

(31) The term "State" means any of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands,

Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

(32) The term "State authority" means the agency established or designated under section 4007 [42 USCS § 6947].

(33) The term "storage", when used in connection with hazardous waste, means the containment of hazardous waste, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste.

(34) The term "treatment", when used in connection with hazardous waste, means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste nonhazardous, safer for transport, amenable for recovery, amenable for storage, or reduced in volume. Such term includes any activity or processing designed to change the physical form or chemical composition of hazardous waste so as to render it nonhazardous.

(35) The term "virgin material" means a raw material, including previously unused copper, aluminum, lead, zinc, iron, or other metal or metal ore, any undeveloped resource that is, or with new technology will become, a source of raw materials.

(36) The term "used oil" means any oil which has been—

(A) refined from crude oil,

(B) used, and

(C) as a result of such use, contaminated by physical or chemical impurities.

(37) The term "recycled oil" means any used oil which is reused, following its original use, for any purpose (including the purpose for which the oil was originally used). Such term includes oil which is re-refined, reclaimed, burned, or reprocessed.

(38) The term "lubricating oil" means the fraction of crude oil which is sold for purposes of reducing friction in any industrial or mechanical device. Such term includes re-refined oil.

(39) The term "re-refined oil" means used oil from which the physical and chemical contaminants acquired through previous use have been removed through a refining process.

(Oct. 20, 1965, P. L. 89-272, Title II, Subtitle A, § 1004, as added Oct. 21, 1976, P. L. 94-580, § 2, 90 Stat. 2798; Nov. 8, 1978, P. L. 95-609, § 7(b), 92 Stat. 3081; Oct. 15, 1980, P.L. 96-463, § 3, 94 Stat. 2055; Oct. 21, 1980, P. L. 96-482, § 2, 94 Stat. 2334.)

#### HISTORY: ANCILLARY LAWS AND DIRECTIVES

##### Explanatory notes:

The bracketed "." was inserted in para. (8), as punctuation probably intended by Congress in amendment by Act Nov. 8, 1978.

## WELFARE

## SOLID WASTE DISPOSAL

## 42 USCS § 6904

Similar provisions were contained in 42 USCS § 3252 prior to general revision of the Act of Oct. 20, 1965, P. L. 89-272 by Act Oct. 21, 1976, P. L. 94-580, 90 Stat. 2795.

### Amendments:

1978. Act Nov. 8, 1978, in para. (8), deleted "and after December 31, 1979, such term does not include salaries of employees due pursuant to subtitle D of this Act." which appeared after "or improvement of land": in para. (10), substituted "management" for "disposal"; substituted new para. (29) for one which read: "The term 'solid waste management facility' includes (A) any resource recovery system or component thereof, (B) any system, program, or facility for resource conservation, and (C) any facility for the treatment of solid wastes, including hazardous wastes, whether such facility is associated with facilities generating such wastes or otherwise."

1980. Act Oct. 15, 1980, added paras. (36)-(39).

Act Oct. 21, 1980 substituted para. (14) for one which read: "The term 'open dump' means a site for the disposal of solid waste which is not a sanitary landfill within the meaning of section 4004."; and substituted para. (19) for one which read: "The term 'recovered material' means material which has been collected or recovered from solid waste."

### Transfer of functions:

Enforcement functions of Administrator or other official of the Environmental Protection Agency related to compliance with resource conservation and recovery permits used under 42 USCS §§ 6901 et seq. with respect to preconstruction, construction, and initial operation of transportation system for Canadian and Alaskan natural gas were transferred to the Federal Inspector, Office of Federal Inspector for the Alaska Natural Gas Transportation System, until the first anniversary of date of initial operation of the Alaska Natural Gas Transportation System, see Reorg. Plan No. 1 of 1979, effective July 1, 1979, §§ 102(a), 203(a), 4 Fed. Reg. 33663, 33666, 93 Stat. 1373, 1376, which appears as 5 USCS § 903 note.

## CROSS REFERENCES

This section is referred to in 42 USCS §§ 5919, 6921.

## RESEARCH GUIDE

### Am Jur:

16 Am Jur 2d, Constitutional Law §§ 290, 292.

61A Am Jur 2d, Pollution Control §§ 7, 9, 146, 244, 246, 247, 253, 265, 274.

## § 6904. Governmental cooperation

(a) **Interstate cooperation.** The provisions of this Act [42 USCS §§ 6901 et seq.] to be carried out by States may be carried out by interstate agencies and provisions applicable to States may apply to interstate regions where such agencies and regions have been established by the respective States

agencies in accordance with subtitle D of this Act [42 USCS §§ 6941 et seq.] other than section 4008(a)(2) or 4009 [42 USCS § 6948(a)(2) or 6949]. (Oct. 20, 1965, P. L. 89-272, Title II, Subtitle B, § 2007 [2006], as added Oct. 21, 1976, P. L. 94-580, § 2, 90 Stat. 2805; Oct. 15, 1980, P. L. 96-463, § 4(a), 94 Stat. 2055; Oct. 21, 1980, P. L. 96-482, §§ 6, 31(a), 94 Stat. 2336, 2352.)

### HISTORY; ANCILLARY LAWS AND DIRECTIVES

#### Explanatory notes:

The bracketed comma is inserted in subsec. (a) to reflect the probable intent of Congress.

#### Amendments:

1980. Act Oct. 21, 1980, in subsec. (a), deleted "and" following "1978", and inserted "\$70,000,000 for the fiscal year ending September 30, 1980, \$80,000,000 for the fiscal year ending September 30, 1981, and \$80,000,000 for the fiscal year ending September 30, 1982"; in subsec. (b), inserted ", or \$5,000,000 per fiscal years, whichever is less,"; and added subsec. (d).

#### Redesignation:

This section, formerly § 2006 of Act Oct. 20, 1965, P. L. 89-272, as added Oct. 21, 1976, P. L. 94-580, § 2, 90 Stat. 2803, was redesignated § 2007 of such Act by Act Oct. 15, 1980, P. L. 96-463, § 4(a), 94 Stat. 2055.

#### Transfer of functions:

For transfer of certain enforcement functions of Administrator or other official of the Environmental Protection Agency under 42 USCS §§ 6901 et seq. to Federal Inspector, Office of Federal Inspector for the Alaska Natural Gas Transportation System, see 42 USCS § 6903 note.

## HAZARDOUS WASTE MANAGEMENT

### CROSS REFERENCES

This subchapter is referred to in 42 USCS §§ 2022, 6916, 6948, 6972.

### § 6921. Identification and listing of hazardous waste

(a) **Criteria for identification or listing.** Not later than eighteen months after the date of the enactment of this Act [enacted Oct. 21, 1976], the Administrator shall, after notice and opportunity for public hearing, and after consultation with appropriate Federal and State agencies, develop and promulgate criteria for identifying the characteristics of hazardous waste, and for listing hazardous waste, which should be subject to the provisions of this subtitle [42 USCS §§ 6921 et seq.], taking into account toxicity, persistence, and degradability in nature, potential for accumulation in tissue, and other related factors such as flammability, corrosiveness, and

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(b) **Identification and listing.** (1) Not later than eighteen months after the date of enactment of this section [enacted Oct. 21, 1976], and after notice and opportunity for public hearing, the Administrator shall promulgate regulations identifying the characteristics of hazardous waste, and listing particular hazardous wastes (within the meaning of section 1004(5) [42 USCS § 6903(5)]), which shall be subject to the provisions of this subtitle [42 USCS §§ 6921 et seq.]. Such regulations shall be based on the criteria promulgated under subsection (a) and shall be revised from time to time thereafter as may be appropriate.

(2)(A) Notwithstanding the provisions of paragraph (1) of this subsection, drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy shall be subject only to existing State or Federal regulatory programs in lieu of subtitle C [42 USCS §§ 6921 et seq.] until at least 24 months after the date of enactment of the Solid Waste Disposal Act Amendments of 1980 [enacted Oct. 21, 1980] and after promulgation of the regulations in accordance with subparagraphs (B) and (C) of this paragraph. It is the sense of the Congress that such State or Federal programs should include, for waste disposal sites which are to be closed, provisions requiring at least the following:

(i) The identification through surveying, platting, or other measures, together with recordation of such information on the public record, so as to assure that the location where such wastes are disposed of can be located in the future; except however, that no such surveying, platting, or other measure identifying the location of a disposal site for drilling fluids and associated wastes shall be required if the distance from the disposal site to the surveyed or platted location to the associated well is less than two hundred lineal feet; and

(ii) A chemical and physical analysis of a produced water and a composition of a drilling fluid suspected to contain a hazardous material, with such information to be acquired prior to closure and to be placed on the public record.

(B) Not later than six months after completion and submission of the study required by section 8002(m) of this Act [42 USCS § 6982(m)], the Administrator shall, after public hearings and opportunity for comment, determine either to promulgate regulation; under this subtitle [42 USCS §§ 6921 et seq.] for drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy or that such regulations are unwarranted. The Administrator shall publish his decision in the Federal Register accompanied by an explanation and justification of the reasons for it. In making the decision under this

paragraph, the Administrator shall utilize the information developed or accumulated pursuant to the study required under section 8002(n) [42 USCS § 6982(m)].

(C) The Administrator shall transmit his decision, along with any regulations, if necessary, to both Houses of Congress. Such regulations shall take effect only when authorized by Act of Congress.

(3)(A) Notwithstanding the provisions of paragraph (1) of this subsection, each waste listed below shall, except as provided in subparagraph (B) of this paragraph, be subject only to regulation under other applicable provisions of Federal or State law in lieu of this subtitle [42 USCS §§ 6921 et seq.] until at least six months after the date of submission of the applicable study required to be conducted under subsection (f), (n), (o), or (p) of section 8002 of this Act [42 USCS § 6982(f), (n), (o), or (p)] and after promulgation of regulations in accordance with subparagraph (C) of this paragraph:

(i) Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels.

(ii) Solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore.

(iii) Cement kiln dust waste.

(B)(i) Owners and operators of disposal sites for wastes listed in subparagraph (A) may be required by the Administrator, through regulations prescribed under authority of section 2002 of this Act [42 USCS § 6912]—

(I) as to disposal sites for such wastes which are to be closed, to identify the locations of such sites through surveying, platting, or other measures, together with recordation of such information on the public record, to assure that the locations where such wastes are disposed of are known and can be located in the future, and

(II) to provide chemical and physical analysis and composition of such wastes, based on available information, to be placed on the public record.

(ii)(I) In conducting any study under subsection (f), (n), (o), or (p), of section 8002 of this Act [42 USCS § 6982(f), (n), (o), or (p)], any officer, employee, or authorized representative of the Environmental Protection Agency, duly designated by the Administrator, is authorized, at reasonable times and as reasonably necessary for the purposes of such study, to enter any establishment where any waste subject to such study is generated, stored, treated, disposed of, or transported from; to inspect, take samples, and conduct monitoring and testing; and to have access to and copy records relating to such waste. Each such inspection

## 42 USCS § 6916

## PUBLIC HEALTH AND WELFARE

## SOLID WASTE

year ending September 30, 1986, \$80,000,000 for the fiscal year ending September 30, 1987, and \$80,000,000 for the fiscal year 1988.

(b)-(d) [Unchanged]

(e) **Criminal investigators.** There is authorized to be appropriated to the Administrator \$3,246,000 for the fiscal year 1985, \$2,408,300 for the fiscal year 1986, \$2,529,000 for the fiscal year 1987, and \$2,529,000 for the fiscal year 1988 to be used—

(1) for additional officers or employees of the Environmental Protection Agency authorized by the Administrator to conduct criminal investigations (to investigate, or supervise the investigation of, any activity for which a criminal penalty is provided) under this Act [42 USCS §§ 6901 et seq.]; and

(2) for support costs for such additional officers or employees.

(f) **Underground storage tanks.** (1) There are authorized to be appropriated to the Administrator for the purpose of carrying out the provisions of subtitle I [42 USCS §§ 6991 et seq.] (relating to regulation of underground storage tanks), \$10,000,000 for each of the fiscal years 1985 through 1988.

(2) There is authorized to be appropriated \$25,000,000 for each of the fiscal years 1985 through 1988 to be used to make grants to the States for purposes of assisting the States in the development and implementation of approved State underground storage tank release detection, prevention, and correction programs under subtitle I [42 USCS §§ 6991 et seq.].

(As amended Nov. 8, 1984, P. L. 98-616, § 2(a), (i), 98 Stat. 3222, 3223.)

### HISTORY; ANCILLARY LAWS AND DIRECTIVES

#### Amendments:

1984, Act Nov. 8, 1984, in subsec. (a), substituted "\$80,000,000 for the fiscal year ending September 30, 1982, \$70,000,000 for the fiscal year ending September 30, 1985, \$80,000,000 for the fiscal year ending September 30, 1986, \$80,000,000 for the fiscal year ending September 30, 1987, and \$80,000,000 for the fiscal year 1988" for "and \$80,000,000 for the fiscal year ending September 30, 1982"; and added subsecs. (e) and (f).

### § 6917. [Terminated]

### HISTORY; ANCILLARY LAWS AND DIRECTIVES

This section (Act Oct. 20, 1965, P. L. 89-272, Title II, Subtitle B, § 2008, as added Nov. 8, 1984, P. L. 98-616, Title I, § 103(a), 98 Stat. 3225) terminated four years after enactment on Nov. 8, 1984, as provided by former subsec. (d) of such section. It provided for an Office of Ombudsman to receive individual complaints, grievances, or requests for information.

### § 6921. Identification and listing of hazardous waste

(a) [Unchanged]

(b) **Identification and listing.** (1) Not later than eighteen months after the date of enactment of this section [enacted Oct. 21, 1976], and after notice and opportunity for public hearing, the Administrator shall promulgate regulations identifying the characteristics of hazardous waste, and listing particular hazardous wastes (within the meaning of section 1004(5) [42 USCS § 6903(5)]), which shall be subject to the provisions of this subtitle [42 USCS §§ 6921 et seq.]. Such regulations shall be based on the criteria promulgated under subsection (a) and shall be revised from time to time thereafter as may be appropriate. The Administrator, in cooperation with the Agency for Toxic Substances and Disease Registry and the National Toxicology Program, shall also identify or list those hazardous wastes which shall be subject to the provisions of this subtitle [42 USCS §§ 6921 et seq.] solely because of the presence in such wastes of certain constituents (such as identified carcinogens, mutagens, or teratogens) at levels in excess of levels which endanger human health.

(2), (3) [Unchanged]

(c) [Unchanged]

(d) **Small quantity generator waste.** (1) By March 31, 1986, the Administrator shall promulgate standards under sections 3002, 3003, and 3004 [42 USCS §§ 6922-6924] for hazardous waste generated by a generator in a total quantity of hazardous waste greater than one hundred kilograms but less than one thousand kilograms during a calendar month.

(2) The standards referred to in paragraph (1), including standards applicable to the legitimate use, reuse, recycling, and reclamation of such wastes, may vary from the standards applicable to hazardous waste generated by larger quantity generators, but such standards shall be sufficient to protect human health and the environment.

(3) Not later than two hundred and seventy days after the enactment of the Hazardous and Solid Waste Amendments of 1984 [enacted Nov. 8, 1984] any hazardous waste which is part of a total quantity generated by a generator generating greater than one hundred kilograms but less than one thousand kilograms during one calendar month and which is shipped off the premises on which such waste is generated shall be accompanied by a copy of the Environmental Protection Agency Uniform Hazardous Waste Manifest form signed by the generator. This form shall contain the following information:

(A) the name and address of the generator of the waste;

(B) the United States Department of Transportation description of the waste, including the proper shipping name, hazard class, and identification number (UN/NA), if applicable;

(C) the number and type of containers;

(D) the quantity of waste being transported; and

(E) the name and address of the facility designated to receive the waste.

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Remedy or remedial action not including offsite transport of hazardous substances, or the storage, treatment, destruction, or secure disposition offsite of such substances unless such action will create new capacity to manage in compliance with this subchapter, see section 9604 of this title.

Reports and studies concerning additional hazardous wastes and construction and operation of hazardous waste facilities, see section 9651 of this title.

Requirements for facilities, including those under this subchapter, to establish and maintain evidence of financial responsibility, promulgated no earlier than five years after December 11, 1980, see section 9608 of this title.

Rules for protection from hazards at inactive or depository uranium mill tailings sites consistent with standards required by this subchapter, see section 2022 of this title.

## § 6921. Identification and listing of hazardous waste

### (a) Criteria for identification or listing

Not later than eighteen months after October 21, 1976, the Administrator shall, after notice and opportunity for public hearing, and after consultation with appropriate Federal and State agencies, develop and promulgate criteria for identifying the characteristics of hazardous waste, and for listing hazardous waste, which should be subject to the provisions of this subchapter, taking into account toxicity, persistence, and degradability in nature, potential for accumulation in tissue, and other related factors such as flammability, corrosiveness, and other hazardous characteristics. Such criteria shall be revised from time to time as may be appropriate.

### (b) Identification and listing

(1) Not later than eighteen months after October 21, 1976, and after notice and opportunity for public hearing, the Administrator shall promulgate regulations identifying the characteristics of hazardous waste, and listing particular hazardous wastes (within the meaning of section 6903(5) of this title), which shall be subject to the provisions of this subchapter. Such regulations shall be based on the criteria promulgated under subsection (a) of this section and shall be revised from time to time thereafter as may be appropriate.

(2)(A) Notwithstanding the provisions of paragraph (1) of this subsection, drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy shall be subject only to existing State or Federal regulatory programs in lieu of this subchapter until at least 24 months after October 21, 1980, and after promulgation of the regulations in accordance with subparagraphs (B) and (C) of this paragraph. It is the sense of the Congress that such State or Federal programs should include, for waste disposal sites which are to be closed, provisions requiring at least the following:

(i) The identification through surveying, platting, or other measures, together with recordation of such information on the public record, so as to assure that the location where such wastes are disposed of can be located in the future; except however, that no such surveying, platting, or other measure identifying the location of a disposal site for drilling fluids and associated wastes shall be required if the distance from the

transport of hazardous substances, or the storage of such substances unless such storage is in compliance with this subchapter, see section 19-101.

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tober 21, 1976, the Administrator shall hold a public hearing, and after consultation with interested parties, develop and promulgate criteria for listing hazardous waste, and for listing hazardous materials under the provisions of this subchapter, based upon their degradability in nature, potential health-related factors such as flammability, toxicity, and other characteristics. Such criteria shall be appropriate.

### and listing

October 21, 1976, and after no Administrator shall promulgate of hazardous waste, and listing meaning of section 6903(5) of this ons of this subchapter. Such reg- ulated under subsection (a) of ne to time thereafter as may be

paragraph (1) of this subsection, wastes associated with the exploration or production of oil or natural gas or geothermal energy under Federal regulatory programs shall be subject to this subsection 12 months after October 21, 1980, in accordance with subparagraphs (2) and (3). It is the sense of the Congress that such wastes include, but are not limited to, oil or waste disposal sites which are the following:

ing, platting, or other measures, information on the public record, so such wastes are disposed of can be that no such surveying, platting, or of a disposal site for drilling required if the distance from the

disposal site to the surveyed or platted location to the associated well is less than two hundred lineal feet; and

(ii) A chemical and physical analysis of a produced water and a composition of a drilling fluid suspected to contain a hazardous material, with such information to be acquired prior to closure and to be placed on the public record.

(B) Not later than six months after completion and submission of the study required by section 6982(m) of this title, the Administrator shall, after public hearings and opportunity for comment, determine either to promulgate regulations under this subchapter for drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy or that such regulations are unwarranted. The Administrator shall publish his decision in the Federal Register accompanied by an explanation and justification of the reasons for it. In making the decision under this paragraph, the Administrator shall utilize the information developed or accumulated pursuant to the study required under section 6982(m) of this title.

(C) The Administrator shall transmit his decision, along with any regulations, if necessary, to both Houses of Congress. Such regulations shall take effect only when authorized by Act of Congress.

(3)(A) Notwithstanding the provisions of paragraph (1) of this subsection, each waste listed below shall, except as provided in subparagraph (B) of this paragraph, be subject only to regulation under other applicable provisions of Federal or State law in lieu of this subchapter until at least six months after the date of submission of the applicable study required to be conducted under subsection (f), (n), (o), or (p) of section 5982 of this title and after promulgation of regulations in accordance with subparagraph (C) of this paragraph:

(i) Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels.

(ii) Solid waste from the extraction, beneficiation, and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore.

(iii) Cement kiln dust waste.

(B)(i) Owners and operators of disposal sites for wastes listed in subparagraph (A) may be required by the Administrator, through regulations prescribed under authority of section 6912 of this title—

(1) as to disposal sites for such wastes which are to be closed, to identify the locations of such sites through surveying, platting, or other measures, together with recordation of such information on the public record, to assure that the locations where such wastes are disposed of are known and can be located in the future, and

(II) to provide chemical and physical analysis and composition of such wastes, based on available information, to be placed on the public record.