

**Appendix G**  
**Federal Efforts To Correct**  
**Groundwater Contamination**

## G.1 CORRECTIVE ACTION PROVISIONS FOR CATEGORY I SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Subsurface Percolation	Safe Drinking Water Act Underground Injection Control Program (40 CFR 144 and 146)	<del>Cesspools or other waste receiving devices</del> with open bottoms and <del>-tires</del> perforated sides (class v wells). Applies only to units serving 20 or more persons.	Not specified.	<ul style="list-style-type: none"> <li>o No specific corrective action requirements.</li> <li>o If there may be a violation of primary drinking water regulations or if the presence of a contaminant may be adversely affecting the health of persons, enforcement or administrative actions can be taken to prevent the violation or adverse effect.</li> </ul>
Injection Wells	-Safe Drinking Water Act	Wells that inject hazardous waste (as defined by RCRA) <del>beneath</del> the deepest ground Injection formation containing, within one-quarter mile of the well bore, an underground source of drinking water (Class I wells).	Not specified.	<ul style="list-style-type: none"> <li>o Aquifer cleanup shall be prescribed by the regulatory authority if it is deemed necessary and feasible to ensure adequate protection of all underground sources of drinking water.</li> <li>o If there may be a violation of primary drinking water regulations or if the presence of a contaminant may be adversely affecting the health of persons, enforcement or administrative actions can be taken to prevent the violation or adverse effect.</li> </ul>
Hazardous waste		Wells that inject hazardous waste (as defined by RCRA) <del>into or above</del> a formation containing, within one-quarter mile of the well bore, an underground source of drinking water (Class IV wells).	Not specified.	<ul style="list-style-type: none"> <li>o No specific corrective action requirements.</li> <li>o If there may be a violation of primary drinking water regulations or if the presence of a contaminant may be adversely affecting the health of persons, enforcement or administrative actions can be taken to prevent the violation or adverse effect.</li> </ul>

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Injection Wells - Comprehensive Hazardous Waste (Continued)	Environmental Response, Compensation, and Liability Act (40 CFR 300)	Wells that release any hazardous substance, pollutant, or contaminant (as defined by CERCLA).	Not specified.	Responses can be "removal" (short-term, emergency) actions or "remedial" (longer term, consistent with permanent remedy) actions. Remedial actions can be taken only at sites on the National Priorities List and must be consistent with requirements specified in National Contingency Plan. Selection of a remedy is based on a determination of cost-effectiveness (lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).
Injection Wells - Non-Hazardous Wrote	Safe Drinking Water Act - Underground Injection Control Program (40 CFR 144 and 146)	Wells that inject waste beneath the deepest formation containing, within one-quarter mile of the well bore, an underground source of drinking water (C&S I wells).	Not specified.	Same as requirements for hazardous waste disposal wells that inject beneath the deepest source of drinking water under SDWA.
Injection Wells - Non-Waste	Safe Drinking Water Act - Underground Injection Control Program (40 CFR 144 and 146)	Wells used in connection with oil and gas production which inject fluids (Class II wells). Includes wells used for enhanced recovery, for storage of liquid hydrocarbons, and for wells where injected fluids are brought to the surface and may be combined with waste waters from gas plants.	Not specified.	Same as requirements for hazardous waste disposal wells that inject beneath the deepest sources of drinking water under SDWA.
		Wells used for extraction of minerals (Class III wells). Includes mining of sulfur by Frasch process, in-situ production of uranium and other metals, and solution mining of salts or potash.	Not specified.	Same as requirements for hazardous waste disposal wells that inject beneath the deepest source of drinking water under SDWA.

Source	Statutory Authority	Definition of Scarce	Cleanup Standard	Corrective Action Provisions
Injection Wells - Non-Waste (Continued)	Safe Drinking Water Act - Underground Injection Control Program (40 CFR 144 and 146) (continued)	wells not included in Categories I, II, III, and IV (Class V wells). Examples of Class V wells include artificial recharge wells, cooling water, or air conditioning return flow wells.	Not specified.	<ul style="list-style-type: none"> <li>o No specific corrective action requirements.</li> <li>o If there may be a violation of primary drinking water regulations or if the presence of a contaminant may be adversely affecting the health of persons, enforcement or administrative actions can be taken to prevent the violation or adverse effect.</li> </ul>
Land Application - Wastewater	Clean Water Act - Section 201 (40 CFR 35; 41 FR 6190, 2/11/76)	Wastewater land treatment processes (includes slow rate, rapid infiltration, and overland flow methods).	Not specified.	<ul style="list-style-type: none"> <li>o No specific corrective action requirements.</li> <li>o However, if project is funded as Innovative and Alternative Technology, grant assistance may be awarded for the modification or replacement of projects that have not met design performance specifications (unless failure is due to negligence), correction of failure requires significantly increased capital or operating and maintenance expenditures, and failure occurs within the 5 year period following final inspection.</li> </ul>
Land Application - Wastewater Byproducts	Clean Water Act - Section 405 (40 CFR 257)	Sewage sludge application (includes agricultural, forest and land reclamation utilization, and dedicated land disposal).	Not specified.	Same as requirements for land application of wastewater under CWA Section 201.
Land Application - Hazardous waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Land treatment of hazardous wastes (as defined by RCRA).	Corrective action program must prevent specified hazardous constituents from exceeding their respective limits established in the groundwater protection standard. (See app. E.1 on Monitoring Provisions for a description of the groundwater protection standard.)	<ul style="list-style-type: none"> <li>o Corrective action program must be conducted at the compliance point and between the compliance point and the downgradient facility property boundary, as necessary to meet the cleanup standard. <u>Corrective actions are not required beyond the downgradient facility property boundary.</u></li> <li>o Hazardous constituents must be removed or treated in place. Facility permit will specify the corrective action measures to be taken.</li> </ul>

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Land Application - Resource Hazardous Waste (Continued)	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)			<ul style="list-style-type: none"> <li>o Corrective action must begin within a reasonable time period after groundwater protection standard is exceeded (time period specified in facility permit).</li> <li>o Corrective action measures must be continued during and beyond the compliance period to the extent necessary to ensure that the groundwater protection standard is not exceeded. corrective action measures continued beyond the compliance period may be terminated if corrective action monitoring (see app. E1) indicates that the groundwater protection standard has not been exceeded for three consecutive years.</li> <li>o The effectiveness of corrective action measures must be reported to the regulatory authority. If a corrective action program no longer satisfies the regulatory requirements, appropriate changes must be submitted within 90 days.</li> <li>o Enforcement action can also be taken under Section 7003 - Imminent and Substantial Endangerment</li> </ul>
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Land application facilities that release any hazardous substance, pollutant, or contaminant (as defined by CERCLA).	Not specified.	Same as CERCLA provisions for hazardous waste disposal wells.
Land Application Non-Hazardous waste	Clean Water Act - Section 404 (40 CFR 230)	Disposal sites for dredged or fill material.	Not specified for groundwater.	No corrective action requirements specified for groundwater.

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RCRA and SDWA have overlapping jurisdiction for injection wells used to dispose of hazardous wastes. A permit-by-rule approach has been instituted to coordinate the requirements of both programs. An owner or operator of such a well must comply with all applicable SDWA technical requirements pursuant to the Underground Injection Control Program and certain RCRA administrative requirements. (See 40 CFR 144.14.)

Source: Office of Technology Assessment.

## G.2 CORRECTIVE ACTION PROVISIONS FOR CATEGORY II SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Landfills Hazardous Waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Landfills used for the disposal of hazardous waste (as defined by RCRA).	Corrective action program must prevent specified hazardous constituents from exceeding their respective limits established in the groundwater protection standard (downgradient facility property boundary).	Corrective action program must be conducted at the compliance point and between the compliance point and the downgradient facility property boundary, necessary to meet the cleanup standards established in the groundwater protection standard (downgradient facility property boundary). app. E.2 on monitoring provisions - Hazardous constituents must be removed or treated in place. Facility permit will specify the corrective measures to be taken. Corrective action measures must be continued during and beyond the compliance period to the extent necessary to ensure that the groundwater protection standard is not exceeded. Corrective action measures continued beyond the compliance period may be terminated if corrective action monitoring (see app. E.2) indicates that the groundwater protection standard has not been exceeded for consecutive years. The effectiveness of corrective action measures must be reported to the regulatory authority. A corrective action program no longer satisfies the regulatory requirements, appropriate changes must be submitted within 90 days. o Enforcement action can be taken under Section 7003 - Imminent and Substantial Endangerment.
	Toxic Substances Control Act - Section 6 (40 CFR 761)	Chemical waste landfills used for the disposal of PCBs at concentrations of 50 ppm and above.	Not specified.	o Explicit corrective action requirements are not specified in the regulations. o PCB facilities determined to be in violation of the disposal regulations are subject to civil penalty and enforcement provisions of TSCA.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Landfills that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Not specified.	Responses can be "removal" (short-term, emergency) actions or "remedial" (longer term, consistent with RCRA) actions. Remedial actions can be taken only at sites on the National Priorities List and must be consistent with requirements specified in National Contingency Plan. Selection of a remedy is based on a determination of cost-effectiveness (lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Landfills -- Sanitary	Resource Conservation and Recovery Act - Subtitle D (40 CFR 257)	sanitary landfills defined as facilities which pose no reasonable probability of adverse effects on health or the environment from disposal of solid waste (as defined by RCRA).	Not specified.	No specific corrective action requirements.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Sanitary landfills that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as requirements for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Open Dumps (including illegal &m@%) - Waste	Resource Conservation and Recovery Act - Subtitle D (40 CFR 257)	Open dumps defined as facilities which & not meet the criteria for sanitary landfills under RCRA.	Not specified.	No specific corrective action requirements. Facilities must close or be upgraded to meet criteria for sanitary landfills under Subtitle D of RCRA.
	Comprehensive Environmental Response Compensation, and Liability Act (40 CFR 300)	Open dumps that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as requirements for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Residential Disposal	Federal Insecticide, Fungicide, and Rodenticide Act - Section 19 (40 CFR 165)	Burial of small quantities of pesticide containers in open fields (containers which held organic or metallo-organic pesticides except organic mercury, lead, cadmium, or arsenic compounds).	No requirements established.	No requirements established.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
surface Impoundments Hazardous waste	Resource Conserva- tion and Recovery Act- Subtitle C (40 CFR 264)	Surface impoundments used for the treatment, storage, or disposal of hazardous waste (as defined by RCRA).	Same as requirements for hazardous waste landfills under RCRA.	Same as requirements for hazardous waste landfills under RCRA.
	Comprehensive Environmental Response, Compen- sation, and Liability Act (40 CFR 300)	Surface impoundments that release any haz- ardous substance, pollutant or contaminant (as defined by CERCLA).	Same as requirements for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Surface Impoundments Non-Hazardous waste	Surface Mining Control and Reclamation Act (30 CFR 816 and 817)	Impoundments defined as all water, sediment, slurry or other liquid or semi-liquid holding structures and depressions, either naturally formed or artificially built. Structures may be temporary or permanent. Applies to all surface and underground coal mining operations.	Not specified.	All possible steps must be taken to minimize any adverse impact to the environment or public health and safety resulting from non- compliance with any permit condition including, but not limited to: (i) any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of such actions; (ii) immediate implementation of measures necessary to comply with permit conditions (e.g. hydrologic reclamation plan, as described in app. H.4); and (iii) warning, as soon as possible after learning of such non- compliance, any person whose health and safety is in imminent danger due to the noncompliance.



Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Surface Impoundments Non-Hazardous Wrote (continued)	Federal Land Policy and Management Act <sup>a</sup>			
	- Mineral Leasing Act of 1920 and Materials Act of 1947 (43 CFR 23). Covers minerals such as coal, phosphates, asbestos, sodium, potassium, sand, stone, gravel, and clay.	Impoundments used for the treatment or control of runoff and drainage during mining operations on Federal lands.	Not specified.	Mining plan submitted to the regulatory authority must include provisions for reclamation of disturbed areas. Regulations specify that adequate measures must be taken to correct damage to the environment and to public health and safety.
	- U.S. Mining Laws (43 CFR 3800) Cover locatable minerals such as gold, silver, lead, iron, and copper.	Not explicitly mentioned in the regulations. However, impoundments are part of mining operations. Applies only to operations on Federal lands.	Not specified.	Plan of operations submitted to the regulatory authority must include provisions for reclamation of disturbed areas.
	- Geothermal Steam Act (30 CFR 270 and BLM Operational Order No. 4)	Pits and sumps used to retain all materials and fluids necessary to drilling, production, or other operations on Federal lands.	Not specified.	Adverse environmental impacts from geothermal-related activity must be prevented or mitigated through enforcement of applicable standards and the application of existing technology.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Waste Tailings	Federal Land Policy and Management Act - Mineral Leasing Act of 1920 and Materials Act of 1947 (43 CFR 23)	Not explicitly mentioned in the regulations. For the purposes of this table, however, waste tailings are considered part of mining operations on Federal lands.	Not specified.	Same as requirements for non-hazardous waste surface impoundments under these laws.
	-U.S. Mining Laws (43 CFR 3800)	Not explicitly defined in the regulations, but disposal of waste tailings is mentioned as part of a mining operation.	Not specified.	Same as requirements for non-hazardous waste surface impoundments under these laws.
	Uranium Mill Tailings Radiation Control Act <sup>b</sup> - Active Sites (40 CFR 192)	Disposal areas covered by the regulations containing waste tailings from uranium processing activities. Such areas include the region within the perimeter of an impoundment or pile.	Same as standard for hazardous waste surface impoundments under RCRA.	Same as requirements for hazardous waste surface impoundments under RCRA.
	Uranium Mill Tailings Radiation Control Act - Inactive Sites (40 CFR 192)	Processing sites designated by DOE containing residual radioactive materials at which all or substantially all of the uranium was produced for sale to a Federal agency prior to Jan. 1, 1971.	Not specified.	<ul style="list-style-type: none"> <li>o Decision on whether to institute remedial action, what specific action to take, and cleanup levels should be made on a site-specific basis.</li> <li>o Factors to consider include technical feasibility of improving the aquifer in its hydrogeologic setting, the cost of restorative or protective programs, the present and future value of the aquifer as a water resource, the availability of alternative water supplies, and the degree to which human exposure is likely to occur.</li> </ul>

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Waste Piles Hazardous Waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Waste piles used for the treatment or storage of hazardous wastes (as defined by RCRA).	Same as standard for hazardous waste landfills under RCRA.	Same as requirements for hazardous waste landfills under RCRA.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Waste piles that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as standard for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
	Surface Mining Control and Reclamation Act (30 CFR 816 and 817)	Refuse piles containing coal mine waste (includes coal processing waste and underground development waste). Applies to all surface and underground coal mining operations.	Same as standard for non-hazardous waste surface impoundments under SMCRA.	Same as requirements for non-hazardous waste surface impoundments under SMCRA.
Waste Piles Non-Hazardous Waste	Federal Land Policy and Management Act			
	- Mineral Leasing Act of 1920 and Materials Act of 1947 (43 CFR 23)	Not explicitly mentioned in the regulations. However, waste piles are part of mining operations. Applies only to Federal lands.	Same as standard for non-hazardous waste surface impoundments under these laws.	Same as requirements for non-hazardous waste surface impoundments under these laws.
	- U.S. Mining Laws (43 CFR 3800)	Not explicitly defined in the regulations, but waste piles are mentioned as part of a mining operation.	Same as standard for non-hazardous waste surface impoundments under these laws.	Same as requirements for non-hazardous waste surface impoundments under these laws.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Materials Stockpiles	Federal Insecticide, Fungicide, and Rodenticide Act (40 CFR 165)	Storage of packages and containers of pesticides.	No requirements established.	<ul style="list-style-type: none"> <li>o No requirements established.</li> <li>o It is recommended that materials such as adsorptive clay, hydrated lime, and sodium hypochlorite be obtained for emergency treatment or detoxification of spills or leaks.</li> </ul>
Graveyards	—	—	—	—
Animal Burial	—			
Aboveground Storage Tanks - Hazardous Waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Aboveground tanks used for the treatment or storage of hazardous wastes (as defined by RCRA).	Not specified.	<ul style="list-style-type: none"> <li>o No requirements are established for groundwater contamination per se.</li> <li>o Contingency plan must specify procedures to be used to respond to tank spills or leaks, including procedures and timing for expeditious removal of leaked or spilled waste and repair of the tank.</li> </ul>
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Storage tanks that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as standard for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
	Toxic Substances Control Act (40 CFR 761)	See TSCA requirements, below, for hazardous waste containers.	—	—
Aboveground Storage Tanks - Non-Hazardous waste	—		—	—

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisiona
Aboveground Storage Tanks - Non-Waste	Clean Water Act - Section 311 (40 CFR 112)	Onshore and offshore facilities with above-ground capacities of greater than 1,320 gallons of oil (or single tanks with capacities greater than 660 gallons). <sup>c</sup>	Not specified.	0 No requirements are established for groundwater contamination per se. o The Spill Prevention Control and Countermeasure (SPCC) Plan should provide for prompt correction of visible leaks. In those instances where a facility has experienced spill events, the SPCC Plan must include a description of the spill, corrective actions taken, and plan for preventing a recurrence (if experience indicates a reasonable potential for equipment failure, the plan should also include a prediction of the direction, rate of flow, and total quantity of oil which could be discharged).
	Hazardous Liquid Pipeline Safety Act (49 CFR 195)	storage of hazardous liquids (as defined by HLPFA) incidental to their movement by pipeline in or affecting interstate or foreign commerce. Regulations explicitly define aboveground "breakout tanks" which are used to relieve surges in a hazardous liquid pipeline system or to receive and store hazardous liquid transported by a pipeline. Requirements do not apply to Federal facilities.	Not specified.	No requirements established.
Underground Storage Tanks - Hazardous Waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Covered underground tanks used for the treatment or storage of hazardous waste as defined by RCRA.	Regulations for underground tanks have not been promulgated.	Regulations for underground tanks have not been promulgated.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Underground Storage Tanks - Hazardous Waste (continued)	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Storage tanks that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as standard for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Underground Storage Tanks - Non-Hazardous waste	—	—	—	—
Underground Storage Tanks - Non-Waste	Clean Water Act - section 311 (40 CFR 112)	Onshore facilities with underground storage capacities equal to or greater than 42,000 gallons.	Not specified.	No requirements are established for groundwater contamination per se.
Containers - Hazardous waste	Resource Conservation and Recovery Act - Subtitle C (40 CFR 264)	Containers used for the storage of hazardous wastes (as defined by RCRA).	Not specified.	<ul style="list-style-type: none"> <li>o No requirements are established for groundwater contamination per se.</li> <li>o Spilled or leaked waste and accumulated precipitation must be removed from collection or containment system in as timely a manner as necessary to prevent overflow of the system.</li> </ul>
	Toxic Substances Control Act - Section 6 (40 CFR 761)	Containers used to store PCBs at concentrations of 50 ppm and above. Container means any package, can, bottle, bag, barrel, drum, tank, or other device.	Not specified.	<ul style="list-style-type: none"> <li>o No requirements are established for groundwater contamination per se.</li> <li>o Spilled or leaked materials must be immediately cleaned up, using solvents or other adequate means.</li> </ul>

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Containers Hazardous Waste (continued)	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Containers that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as standard for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Containers Nonhazardous Waste		—	—	
Containers Non-Waste	Federal Insecticide, Fungicide, and Rodenticide Act (40 CFR 165)	Pesticide containers.	See standard for materials stockpiles under FIFRA.	See requirements for materials stockpiles under FIFRA.
Open Burning and Detonation Sites	Resource Conservation and Recovery Act - subtitle c (40 CFR 264)	Open burning and detonation of waste explosives.	Regulations have not been promulgated.	Regulations have not been promulgated.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisiona
Open Burning and Derogation sites (continued)	Federal Insecticide, Fungicide, and Rodenticide Act (40 CFR 165)	Open burning of small quantities of combustible pesticide containers which held organic or metallo-organic pesticides (except organic mercury, lead, cadmium, or arsenic compounds).	Same as standard for residential disposal (burial) under FIFRA.	Same as requirements for residential disposal (burial) under FIFRA.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Sites which release any hazardous substance, pollutant OR contaminant (as defined by CERCLA).	Same as standard for hazardous waste landfills under CERCLA.	Same as requirements for hazardous waste landfills under CERCLA.
Radioactive Disposal sites <sup>a</sup>	Atomic Energy Act (10 CFR 60) <sup>f</sup>	Geologic repositories for high-level radioactive wastes.	No requirements established.	No requirements established.
	Atomic Energy Act (10 CFR 61) <sup>g</sup>	Disposal sites for low-level radioactive waste.	No requirements established.	The licensee must have plans for taking corrective measures if migration of radionuclides would indicate that specified performance objectives may not be met (see app. H.2, for performance objectives).
	Atomic Energy Act <sup>h</sup>	Sites identified by DOE that were used for the storage and processing of nuclear materials.	No requirements established.	No requirements established.

Source: Office of Technology Assessment.



- <sup>a</sup> The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94479) requires that public lands be managed in a manner that will protect the quality of environmental values. In addition, there are a number of laws regulating certain mining activities on Federal lands. The mining regulations are authorized by both the FLPMA and the specific mining laws and are thus presented together in this table. Note that regulations for the Geothermal Steam Act were redesignated, with minor revisions, as 43 CFR 3260 on Sept. 30, 1983.
- <sup>b</sup> The requirements presented in this table are the Health and Environmental Protection Standards promulgated by EPA (40 CFR 192, 48 FR 45926, Oct. 7, 1983). NRC has also promulgated licensing requirements (10 CFR 30, 4070 and 150).
- <sup>c</sup> Facilities include those engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, or consuming oil and oil products. Oil is defined as oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.
- <sup>d</sup> Hazardous liquids include petroleum, petroleum products, and anhydrous ammonia. Although the regulations only mention "breakout tanks," tanks used for storage purposes are also covered by the statutes. Regulations for such storage tanks have not been established by DOT.
- <sup>e</sup> Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other means of treatment. Regulations for permitted facilities have not been promulgated. Interim status regulations for open burning and detonation do not establish corrective action requirements.
- <sup>f</sup> The requirements presented are those established by NRC for high-level radioactive wastes; these requirements are proposed regulations. See 46 FR 35280, July 8, 1981. EPA has also published proposed health and environmental standards. See 47 FR 58196, Dec. 29, 1982.
- <sup>g</sup> The requirements presented are those established by NRC for low-level radioactive waste sites. EPA is also required to establish health and environmental standards for such sites; standards have not yet been promulgated by EPA.
- <sup>h</sup> The cleanup of these sites is not explicitly -- by legislation. However, two programs have been instituted by DOE under the general authorization of the Atomic Energy Act. The Formerly Utilized Sites Remedial Action Program was established in 1974 for identifying and decommissioning former nuclear materials storage and processing facilities (and vicinity properties). The Formerly Utilized Sites Remedial Action Program was established in 1978 for decommissioning DOE owned or operated radioactive contaminated facilities. Decommissioning standards have not yet been established by DOE.

Source: Office of Technology Assessment.

## G.3 CORRECTIVE ACTION PROVISIONS FOR CATEGORY III SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Pipelines - Hazardous Materials	Hazardous Liquid Pipeline safety Act (49 CFR 195)	Pipelines used to transport hazardous liquids specified (include petroleum, petroleum products and anhydrous ammonia).	Not specified.	No requirements established.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Pipelines that release any hazardous substance, pollutant or contaminant (as defined by CERCLA).		Responses can be "removal" (short-term, emergency) actions or "remedial" (longer term, consistent with permanent remedy) actions. Remedial actions can be taken only at sites on the National Priorities List and must be consistent with requirements specified in National Contingency Plan Selection of a remedy. Is based on a determination of cost-effectiveness (lowest cost alternative that is technologically feasible and reliable and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).
Pipelines - Non-Hazardous Materials	—	—	—	—
Materials Transport and Transfer Operations - Hazardous Materials and Waste	Hazardous Materials Transportation Act (49 CFR 171)	The transportation hazardous materials and hazardous waste (as defined by HMTA) by rail car, aircraft vessel, and motor vehicles used in interstate and foreign commerce (and motor vehicles used to transport hazardous waste in intrastate commerce).	No requirements established.	No requirements established.
	Comprehensive Environmental Response, Compensation, and Liability Act (40 CFR 300)	Transport-related accidents that release a hazardous substance, pollutant or contaminant (as defined by CERCLA).	Same as standard for pipelines	Same as requirements for pipelines under CERCLA.

Source: Office of Technology Assessment.

## G.4 CORRECTIVE ACTION PROVISIONS FOR CATEGORY IV SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Irrigation Practices	Clean Water Act - Return flows from irrigated agriculture. Section 208 (40 CFR 35, Subpart G) *	No requirements established.	No requirements established.	No requirements established.
Pesticide Applications	Clean Water Act - Agriculturally related nonpoint sources of pollution. Section 208 (40 CFR 35, Subpart G)	Same as standard for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.
	Federal Insecticide, Fungicide, and Rodenticide Act	- Application of certain pesticides which may cause unreasonable adverse effects on the environment.	No requirements established.	No requirements established.
Fertilizer Application	Clean Water Act - Agriculturally related nonpoint sources of pollution. Section 208 (40 CFR 35, Subpart G)	Same as standard for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.
Animal Feeding Operations	Clean Water Act - Runoff from manure disposal areas and from land area used for livestock. Section 208 (40 CFR 35, Subpart G)	Same as standard for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.	Same as requirements for irrigation practices under CWA.
De-icing Salts Application				

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Urban Runoff	Clean Water Act — Section 208 (40 CFR 35, Subpart G)	Urban stormwater runoff systems.	No requirements established.	No requirements established.
Percolation of Atmospheric Pollutants	--	--		
Mining and Mine Drainage —				
Surface Mining	Clean Water Act — Section 208 (40 CFR, 35, Subpart G)  Federal Land Policy and Management Act — Mineral Leasing Act of 1920 and Materials Act of 1947 (43 CFR 23)	Minerelated sources of pollution including runoff from new, active, and abandoned surface and underground mines.	No requirements established.	No requirements established.
		Mining of minerals such as coal, phosphate, asphalt, sodium, potassium, sand, stone, gravel and clay (on Federal lands).	Not specified.	Mining plan submitted to the regulatory authority must include provisions for reclamation of disturbed areas. Regulations specify that adequate measures must be taken to correct damage to the environment and to public health and safety. Groundwater is not explicitly addressed.
	— U.S. Mining Laws	Mining of minerals such as gold, silver, lead, iron and copper (on Federal lands).	Not specified.	Plan of operations submitted to the regulatory authority must include provisions for reclamation of disturbed areas. Groundwater is not explicitly addressed.
	Surface Mining Control and Reclamation Act (30 CFR 816)	Surface mining of coal.	Not specified.	All possible steps must be taken to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any permit condition including, but not limited to:

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Mining and Mine - Surface Mining (continued)	Surface Mining - l a r d Reclamation Act (30 CFR 816) (continued)			(i) any accelerated or additional monitoring necessary to determine the nature and extent Of noncompliance and the results of such actions; (ii) immediate implementation of measures necessary to comply with permit conditions (e.g. <u>hydrologic reclamation plan</u> , as described In app. H.4); srd (iii) warning, as soon as possible after learning of such noncompliance, any person whose health and safety is In imminent danger due to the noncompliance.
	Surface Mining control and Reclamation Act (30 CFR 874 and 876)	Lads and water which were mined (covers coal mining and mining of minerals and materials other than coal) or which were affected by such mining, wastebanks, processing or other methods @or to Aug. 3, 1977.	Not specified.	o No requirements established. o Grants are available to the States for reclamation activities.
	Clean Water Act - Section 208 (40 CFR 35, Subpart G)	Mine-related sources of pollution including runoff from new, active, and abandoned Surf me and underground mines.	No requirements established.	No requirements established.
Underground Mining	Federal Land Policy and Management Act <sup>a</sup>			
	- Mineral leasing Act of 1920 and Materials Act of 1947 (43 CFR 23)	Mining for minerals such as coal, phosphate, asphalt, sodium, potassium, sand, stone, gravel and clay (on Federal lands).	Same as standard for surface mining under these laws.	Same as requirements for surface mining under these laws.
	- us. Mining Laws (43 CFR 3800)	Mining for minerals such as gold, silver, lead, iron and copper (on Federal lands).	Same as standard for surface mining under these laws	Same as requirements for surface mining under these laws.

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Mining and Mine Drainage - Underground Mining (continued)	Surface Mining Control and Reclamation Act (30 CFR 817)	Underground coal mining. <sup>c</sup>	Same as standard for surface mining under SMCRA.	Same as requirements for surface mining under SMCRA.

<sup>a</sup> 40 CFR 35, Subpart G are the regulations for State grants for Water Quality Planning, Management, and Implementation. Although the Clean Water Act is directed at the protection of surface waters, some states have chosen to include groundwater quality program in their water quality management plans. Such plans are required by the regulations to indicate recognition that groundwater and surface water are interrelated.

<sup>b</sup> The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94-579) requires that public lands be managed in a manner that will protect the quality of environmental values. In addition, there are a number of laws regulating certain mining activities on Federal lands. The mining regulations are authorized by both the FLPMA and the specific mining laws and are presented together in this table.

<sup>c</sup> Applies to surface effects of underground mining.

Source: Office of Technology Assessment.

## G.5 CORRECTIVE ACTION PROVISIONS FOR CATEGORY V SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Production Wells - Geothermal and Heat Recovery	Federal Land Policy and Management Act <sup>a</sup> - Geothermal Steam Act (30 CFR 270 and BLM Operational Order No.4)	Wells used for the development of geothermal steam on Federal lands.	Not specified.	Adverse environmental impacts from geothermal-related activity must be prevented or mitigated through enforcement of applicable standards and the application of existing technology.
Production wells - Water Supply				
Other Wells (non-waste) - Monitoring wells				
Other wells (non-waste) - Exploration	Federal Land Policy and Management Act - Mineral Leasing Act of 1920 and Materials Act of 1947 (43 CFR 23)	Exploration wells used in reinjection operations for minerals such as coal, phosphate, asphalt, sodium, potassium, sand, steam, gravel, and oil (on Federal lands).	Requirements established.	No requirements established.
Construction Excavation	Clean Water Act Section 208 (40 CFR 35, Subpart G) <sup>b</sup>	Construction activity related to sources of pollution.	Requirements established.	No requirements established.

<sup>a</sup> The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94-579) requires that public lands be managed in that manner that will protect the quality of environmental values. In addition, there are a number of laws regulating certain mining activities on Federal lands. The mining regulations are authorized by both the FLPMA and the specific mining laws and are thus presented together in this table. Note that regulation for the Geothermal Steam Act were redesignated, with minor revisions, as 43 CFR 3260 on Sept. 30, 1983.

<sup>b</sup> 40 CFR 35, Subpart G are the regulations for State grants for Water Quality Planning. Management, and Implementation. Although the Clean Water Act is directed at the protection of surface waters, some States have chosen to incorporate water quality programs in their water quality plans. Such plans are required by the regulations to indicate recognition that groundwater and surface water intermix.

Source: Office of Technology Assessment.

## G.6 CORRECTIVE ACTION PROVISIONS FOR CATEGORY VI SOURCES

Source	Statutory Authority	Definition of Source	Cleanup Standard	Corrective Action Provisions
Groundwater - Surface Water Interactions	Clean Water Act section 2043 (40 CFR 35, Subpart G) <sup>a</sup>	-Intermixing of groundwater and surface water.	No requirements established.	No requirements established.
Natural Leaching	Reclamation Act	Natural salt deposits affecting underground water supplies.	No requirements established.	No requirements established. o Water development projects undertaken by the BLM have involved corrective actions due to saline conditions of groundwater.
Salt-water Intrusion	Clean Water Act Sections 208 (40 CFR 35, Subpart G) <sup>a</sup>	-Salt-water intrusion into rivers, lakes, estuaries resulting from reduction of water flow from any cause, including groundwater extraction.	Same as standard for groundwater-surface interactions under CWA.	Same as requirements for groundwater-surface water interactions under CWA.
	Coastal Zone Management Act	Salt-water intrusion.	No requirements established.	No requirements established.

<sup>a</sup> 40 CFR 35, Subpart G are the regulation for State grants for Water Quality Management, and Implementation. Although the Clean Water Act is directed at the protection of surface waters, some States have chosen to include water quality programs in their water quality management plans.

Source: Office of Technology Assessment.