An Introduction to Pollution Control and Environmental Regulations for Steam Power Plants

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1. AIR QUALITY CONTROL

1.1 POLLUTANT PRODUCTION. As a fossil fuel is burned, air pollutants such as sulfur dioxide (SO_2), nitrogen oxides (NOx), and particulate matter are produced. The amount of each formed is dependent upon many factors, the most important of which are fuel type and fuel burning equipment.

1.2 EMISSION LIMITS. The amount of the pollutants produced in the boiler that are allowed to pass out of the stack as emissions is governed by Federal, state, and local regulations.

1.3 EQUIPMENT SELECTION. Examples of particulate matter removal equipment include mechanical cyclones, wet scrubbers, electrostatic precipitators, and fabric filters (baghouses). Sulfur dioxide is normally removed with wet or dry scrubbers. Nitrogen oxides are not normally removed from the exhaust; rather, the pollutant production in the boiler is minimized. Various techniques such as fuel changing, load reduction, and combustion modifications can be employed. However, recently there has been much development work performed with techniques for reducing NOx emissions with the use of Urea, Ammonia or Selective Catalytic Reduction. These systems have been installed on many recent boilers and combustion turbines.

1.4 MONITORING AND REPORTING. Point source emission rate tests are a necessary part of the environmental impact assessment required for all new facilities. In the upgrading of existing installations, compliance is determined through point source emission rate tests. Revisions to the regulations regarding air pollution test requirements for federal installations appear in the Federal Register. The point source emission rate test methods and requirements approved by the EPA are published in the Code of Federal Regulations. The techniques included are for testing for particulate, SO, NOx, and visible emissions and are listed in Table 1.

EPA Method No.	To determine:
1	Sampling site and the minimum number of sampling points required for the extraction of a representative sample of flue gas from a stationary source.
2	Velocity and volumetric flow rate of flue gas.
3	Concentration by volume of carbon dioxide, carbon monoxide, and oxygen in flue gas.
4	Moisture content of flue gas.
5	Particle emissions from stationary source.
6	Suffur dioxide concentration in flue gas.
7	All nitrogen oxides in flue gas except nitrous oxide.
8	Sulfur dioxide and sulfuric acid mist concentrations in flue gas.
9	Opacity of visible emissions.

[1] *40 CFR 60*

Table 1

EPA emission sampling techniques[1]

Sampling ports will be approximately 4 inches in diameter, extend out approximately 4 inches from the stack, and have a flanged removable cover. On double wall stacks, sampling ports may consist of a 4-inch diameter pipe extending from 4 inches outside the stack to the inner edge of the inner stack wall. Sampling ports will be accessible and located so that the cross-sectional area of the stack or flue can be traversed to sample the flue gas. The sampling ports shall be provided and located in accordance with the applicable current Federal or state regulations for fuel-burning equipment.

2. WATER QUALITY CONTROL

2.1 WASTE STREAMS. The number and source of wastewater streams associated with a fossil-fueled steam power plant are dependent upon such factors as fuel type, methods of ash handling, SO_2 removal method, and overall water usage and conservation measures. Possible wastewater sources are listed hereinafter:

a) Chemical wastes resulting from water treatment, backwash, and drainage.
b) Chemical feed area and storage area drains.
c) Laboratory drains.
d) Boiler tube chemical cleaning wastes.
e) Sanitary wastewater. This waste source consists of sanitary wastes originating from plant buildings with sanitary facilities (e.g., restroom toilets and sinks).
f) Steam boiler blowdown. This wastewater is released from the boiler drums to maintain a sufficient water quality in the boiler.
g) Cooling tower water blowdown. This source is present only if cooling towers are employed to remove heat from the steam cycle. This wastewater is released from the cooling water tower to maintain water quality.
h) Plant drains. This source is a result of pump seal water overflows and miscellaneous equipment water drains.
i) Area washdown drains. This wastewater results when plant personnel use hoses to wash down certain equipment and areas in and around plant buildings. For example, floors such as in the scrubber, turbine, and service buildings may be periodically flushed.
j) Oily waste treatment system. Wastewater from this source is a result of treating washdown water from such areas as fuel oil storage, lube oil storage, transformers, service buildings, and turbine building.
k) Ash handling system (from bottom ash removal transport system). Any discharge requires pretreatment for clarification and neutralization.

l) Flue gas desulfurization (FGD). Under normal conditions, process water within the scrubber system is recirculated. At times, however, water quality may degrade to a point where some must be released as wastewater.
m) Storm water runoff.
n) Runoff from coal storage areas and solid waste storage areas. The wastewater must be pretreated before discharge.

2.2 DISCHARGE STANDARDS. Newly constructed plants may be designed as zero discharge facilities. Zero discharge means that although a plant may use water, it does not have a discharge of water. Hence, for this case, discharge standards do not apply. Many facilities do discharge water from the sewage treatment plant, the cooling water system, or from storm water runoff. If there is any water discharge, discharge standards apply.

2.3 TREATMENT AND DISPOSAL METHODS. Wastewaters generated by a power plant should be reused as much as practical to conserve water.

2.3.1 RECYCLE BASIN. A common method of wastewater handling at a power plant involves the use of a recycle basin (also called a reclaim pond). The wastewater streams, properly treated, flow to the recycle basin.

2.3.2 CHEMICAL WASTEWATER. Wastes from steam condensate treatment, chemical feed and storage area drains, laboratory drains, and metal cleaning wastewater are corrosive and should be collected in a separate piping system from other plant drains. These wastes are normally directed to a treatment tank where they are mixed with the proper chemicals until the entire solution is no longer corrosive (i.e., neutralized). The neutralized wastewater can then be discharged to the recycle basin or to the sanitary sewer.

2.3.3 SANITARY WASTEWATER. Sanitary wastewater is typically directed to a sewage treatment plant located on site. The treatment plant processes the sanitary wastes and discharges either to the streams or to the recycle basin.

2.3.4 STORM WATER RUNOFF. Roof and yard drain storm water runoff is reasonably clean and discharged with the storm system without treatment.

2.3.5 LEACHATE AND RUNOFF FROM COAL STORAGE AREAS. Discharge waters from coal storage areas and solid waste storage require treatment, which includes settlement, clarification, and neutralization, to satisfy local regulations for wastewater discharge of storm water.

2.3.6 OILY WASTEWATER. Oil-contaminated wastewater must be treated before being allowed to enter a recycle basin. This treatment is normally accomplished through the use of an oil separator. This device operates by allowing the oil and wastewater to separate naturally (because of their difference in densities). The separated oil is directed to waste oil storage containers while the de-oiled wastewater is discharged to the recycle basin.

3. OIL SPILL CONTROL

3.1 POSSIBLE SOURCES OF SPILLS

3.1.1 BULK OIL STORAGE TANKS. Spills may originate from tank rupture, overflow, or valve and pipe leakage. In addition, the process of filling the tanks from a barge, a railroad tank car, or a truck may cause an oil spill.

3.1.2 LUBE OIL TANKS. Lubricating oil tanks are normally located indoors. Spills may originate from tank rupture, valve and pipe leakage, or lube oil drippings from equipment which, if unconfined, may be sources of oil spills.

3.1.3 OIL-FILLED TRANSFORMERS. Most large electrical transformers are filled with oil for purposes of cooling. Their location can be indoors or outdoors and ground level or elevated. For example, transformers for electrostatic precipitators are typically located atop the precipitator structure itself. Spills may originate as a result of rupture or seal leakage.

3.2 METHODS OF PREVENTION. According to oil spill regulations and permitting, appropriate containment and diversionary structures or equipment to prevent discharged oil from reaching a navigable watercourse should be provided. The following systems or their equivalent should be used as a minimum:

a) Dikes, berms or retaining walls
b) Curbing
c) Oil/water separators
d) Gravel-filled retention area under transformers

For example, the area surrounding the fuel oil storage tanks shall be provided with dikes with controlled water discharge to confine oil spills and to collect rainwater runoff that

may be contaminated with oil. Oil/water separators may be required on the water discharge control to satisfy some state requirements.

3.3 METHODS OF CLEANUP. If a spill occurs, appropriate cleanup action must be taken. Confined spills above ground may be cleaned up through use of oil-absorbent materials. Permeated soils shall be removed, and uncontaminated soils shall be used as a replacement. If the plant is located near a navigable watercourse, appropriate clean up equipment must be on hand for spills on such a water surface. Additional information concerning oil spill prevention and cleanup can be found in the Code of Federal Regulations.

4. SOLID WASTE DISPOSAL

4.1 SOLID WASTE PRODUCTION. The sources and amounts of solid waste produced by a fossil-fueled steam power plant are dependent mainly on the fuel type, fuel burn rate, and degree of pollutant removal from the boiler exhaust. Other factors, such as fuel burning equipment, may also affect the solid waste production rate. Solid wastes produced at a plant burning fossil fuel include fly ash, bottom ash, pulverizer rejects (if pulverized coal is burned), and flue gas desulfurization scrubber solids (if an FGD device is employed).

4.1.1 FLY ASH. Fly ash consists of the fine ash particles that are entrained in the boiler exhaust gases. Particulate emissions from natural-gas-fired boilers are negligible and thus are not a source of solid waste.

4.1.2 BOTTOM ASH. Bottom ash consists of the large particles of solid combustion products (ash) and unburned carbon that fall out in the bottom of the boiler.

4.1.3 PULVERIZER REJECTS. Pulverizer rejects consist of a variety of coarse, heavy pieces of hard rock or slate and iron pyrites that are separated from coal during pulverization. The amount produced varies with the particular coal being pulverized. A reasonable estimate can be made, however, if it is assumed that rejects comprise 0.5 percent of the coal fired.

4.1.4 FGD SCRUBBER SOLIDS. Solids from an FGD device consist of sulfate and sulfite reaction products resulting from the absorption of sulfur dioxide from the boiler exhaust. The particular solids formed depend on the scrubber type. The quantity of scrubber solids produced varies with the amount of SO_2 removed from the boiler exhaust and with the type of solids produced. Generally, a mass balance calculation is required to determine the quantity of scrubber solids generated.

4.2 METHODS OF TREATMENT AND DISPOSAL

4.2.1 REQUIREMENTS. At this time, the solid wastes produced at a fossil-fueled steam power plant are not categorized as hazardous by the Environmental Protection Agency. Therefore, according to the Resource Conservation and Recovery Act (RCRA) of 1976, the wastes may be landfilled utilizing environmentally acceptable practices. Since RCRA requires that a landfill not contaminate an underground drinking water source beyond the solid waste boundary, leachate control must be incorporated. This is usually accomplished through the use of liners, either clay or a synthetic membrane.

4.2.2 FLY ASH. If not sold to an outside party such as cement or concrete block manufacturers, fly ash can be disposed of as a solid waste in a landfill.

4.2.3 BOTTOM ASH. This waste product is generally disposed of in either settling ponds or a landfill. The choice of which to use depends on economics, space availability, and compatibility with the bottom ash removal system. For example, if the bottom ash is removed dry (i.e., mechanically) the preferred disposal method is a landfill. However, if the waste is hydraulically removed and plant space is available, a bottom ash pond may be preferred. If space is limited, the bottom ash could be dewatered and then landfilled. Consideration of these factors and others in a detailed study is recommended before deciding on a specific disposal system.

4.2.4 PULVERIZER REJECTS. In most cases, the pulverizer rejects are transferred hydraulically, mechanically or pneumatically to the bottom ash handling system. The combined waste product is then disposed of as discussed in Section 4.2.3 above.

4.2.5 SO_2 SCRUBBER SOLIDS. Treatment and disposal of this waste product can be the most complicated and expensive of the four discussed. To choose a method, consideration must be given to the type of scrubber system employed, chemical composition of waste product, and availability of disposal space. A discussion of various

waste products from FGD systems can be found in MIL-HDBK-1003/6, along with information on alternative disposal methods for scrubber waste products.

4.3 HAZARDOUS WASTE CONSIDERATIONS. The U.S. Environmental Protection Agency (EPA) has interpreted the fossil fuel combustion waste exemption from hazardous classification to extend to other wastes that, 1) are produced in conjunction with the combustion of fossil fuel, 2) are necessarily associated with the production of energy, and 3) are mixed with and co-disposed or co-treated with fly ash, bottom ash, or FGD wastes. Wastes which the EPA has specifically indicated would fall under this co-disposal/co-treatment interpretation include (but are not limited to) boiler cleaning solutions, boiler blowdown, demineralization regenerant, pyrites, and cooling tower blowdown. Therefore, the production of hazardous waste from a fossil-fueled steam power plant should be prevented through proper design choices.

5. ENVIRONMENTAL REGULATIONS AND PERMITTING

5.1 AIR QUALITY REGULATIONS. Air pollution emissions from a fossil fueled steam power plant are regulated by the Federal Government under the Clean Air Act (42 USC & 7401 et seq.). Each of the states also regulates air pollution emissions. All facilities must comply with both Federal regulations and state (and local) regulations. The facility will have to be designed to meet the most stringent requirements. Stack emissions are limited by direct emission limits. This is the pollutant concentration in the flue gas emissions measured in the stack. Stack emissions may also be limited by ambient air quality limitations. These are standards based on measured or calculated pollutant concentrations at ground level off the site of the pollutant source. The stack emissions of major concern in a fossil fueled steam power plant are sulfur dioxide (SO_2), nitrogen oxides (NOx), and particulate matter. Of lesser concern are carbon monoxide (CO) and various trace elements such as mercury and beryllium.

5.1.1 NATIONAL AMBIENT AIR QUALITY STANDARDS. The National Ambient Air Quality Standards (NAAQS) are established by the U.S. Environmental Protection Agency (EPA). The entire United States is supposed to have air quality at least as good as the NAAQS. Any place where the air quality is worse than the NAAQS is said to be a "nonattainment" area. An area can be a nonattainment area for one pollutant and an attainment area for another. Each pollutant is characterized separately. The NAAQS is important to stack emissions because a new facility will not be permitted if calculations (modeling) show that the NAAQS would be exceeded at any point off the facility site. To find out if the NAAQS would be exceeded, the existing pollution level (background) must be known. The modeled impacts of the proposed facility are added to the background. It may be necessary to limit the emissions from a new source so that the NAAQS are protected. The NAAQS values for all six "criteria" pollutants are given in Table 2. These six pollutants include the three major pollutants: SO_2, NOx and particulate matter, discussed above. The primary standard is established at the level requisite to protect the public health, thereby allowing an adequate margin of safety. The secondary

standard is established at the level requisite to protect the public welfare (such as vegetation) from any known or anticipated adverse effects associated with the presence of such pollutants in the ambient air.

	Primary Standard	Secondary Standard
Sulfur dioxide		
3-hour concentration (a)	--	1,300
24-hour concentration (a)	365	--
Annual concentration	80	--
Particulate matter PM10 ©		
24-hour concentration (a)	150	150
Annual concentration	50	50
Carbon monoxide		
1-hour concentration (a)	40 mg/m^3	40 mg/m^3
8-hour concentration	10 mg/m^3	10 mg/m^3
Ozone		
1-hour concentration (b)	235	235
Nitrogen dioxide		
Annual concentration	100	100
Lead		
Calendar quarter	1.5	1.5

(a) Not to be exceeded more than once per year.
(b) Not to be exceeded more than an average of one day per year over 3 years.
(c) Since 1987, the standard has been based on particulate matter with an aerodynamic diameter of 10 microns and less (PM10). Prior to that date, the standard was based on total suspended particulate (TSP).

Table 2

Primary and secondary ambient air quality standards

(micrograms/m^3 except where otherwise noted)

Even if the area is currently nonattainment, a new facility may be permitted. But to receive a permit, other sources of pollution must be reduced. These "offsets" are part of the permitting process. The amount of offsets available can affect the amount of stack emissions permitted from a new source. Each state has also established ambient air quality standards. Most states have adopted the NAAQS. A few have more restrictive standards. The most restrictive standards will apply.

5.1.2 PREVENTION OF SIGNIFICANT DETERIORATION LIMITS. Originally under the Clean Air Act (CAA), new air pollution sources could be added until the ambient air

quality became as bad as the NAAQS. Now the CAA includes limits to the amount of new pollution in clean air areas. These increment limits currently exist for only SO2, NOx, and particulate matter. The maximum permitted increases are as follows:

Pollutant	Maximum Allowable Increase Class I micrograms/m³	Class II micrograms/m³	Class III micrograms/m³
Particulate Matter (TSP)			
Annual geometric mean	5	19	37
24-hour maximum	10	37	75
Sulfur Dioxide			
Annual arithmetic mean	2	20	40
24-hour maximum	5	91	182
3-hour maximum	25	512	700
Nitrogen Dioxide			
Annual arithmetic mean	2.5	25	50

The maximum allowable concentration resulting from an applicable increment will not be allowed to exceed a national primary or secondary ambient air quality standard. The three classes have been established to allow flexibility in new source permitting. Most of the United States is classified as Class II. There are no Class III areas in the country. A Class III area would allow the largest amount of new pollution. The most stringent classification is Class I. These areas are principally international parks and large national wilderness areas, large national parks, and large national memorial parks. If the facility is located within a Class II area, the Class I increments must still be met at the boundaries of any nearby Class I area. All new sources since an established "baseline date" will use up available increments. Old sources which shut down will make more increments available. The amount of increments available to a proposed new source must be calculated as part of the permitting process. Again modeling is used for the calculations. Just as in the NAAQS, the amount of increments available to a new source may affect the amount of stack emissions which can be permitted.

5.1.3 NEW SOURCE PERFORMANCE STANDARDS. Both the EPA and the states have new source performance standards (NSPS). These standards are direct limits on the pollutant concentrations in the flue gas emissions. They vary depending on the fuel

to be burned. The Federal NSPS have been established for three categories of fossil fuel steam power plants as follows:

a) 40 CFR Part 60, Subpart D, Standards of Performance for Fossil Fuel Fired Steam Generators for Which Construction is Commenced After August 17, 1971.

b) 40 CFR Part 60, Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1971.

c) 40 CFR Part 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Unit.

The most stringent of these regulations (Subpart Da) applies to new electric utility steam generating units. The Subpart Db NSPS apply to industrial-commercial-institutional steam generating units larger than 100 million Btu per hour heat input rate. SO_2, NOx and particulate matter are currently regulated under these regulations. A power plant would qualify as an industrial-commercial-institutional steam generating unit as presented in Table 3.

Pollutant	Fuel	Special conditions	Maximum emission Rate (lb/MBtu)
Particulate matter	Coal	Up to 10% annual capacity factor of other fuels	0.05
	Oil		0.
	Coal & other fuels	Other fuels greater than 10% annual capacity factor	0.10
	Wood & other fuels except coal	Annual capacity factor greater than 30% for wood	0.10
	Wood & other fuels except coal	Annual capacity factor greater than 10% for wood and unit less than 250 MBtu/hr	0.20
	Municipal type solid waste	Up to 10% annual capacity factor of other fuels	0.10
Nitrogen dioxide	Natural gas or distillate oil	Low heat release rate	0.10[2]
	Natural gas or distillate oil	High heat release rate	0.20
	Residual oil	Low heat release rate	0.30[3]
	Residual oil	High heat release rate	0.40
	Coal	Mass-feed stoker	0.50
	Coal	Spread stoker or fluidized bed combustion	0.60
	Coal	Pulverized coal	0.70
	Lignite	ND, SD or MT lignite combusted in a slag tap furnace	0.80
	Lignite	All other lignite	0.60
	Coal-derived synthetic fuels		0.50
	Sulfur dioxide		
	Coal	90% reduction[4] plus 1.2 lb/MBtu	
	Oil	90% reduction[4] plus 0.8 lb/MBtu 0r 0.30 lb/MBtu	

1 An opacity limit also exists. Opacity must not exceed 20 percent, except for one six-minute period per hour of not more than 27 percent opacity.
2 For natural gas or distillate oil in a duct burner used in a combined cycle plant, the limit is 0.20 lb/MBtu.
3 For residual oil in a duct burner used in a combined cycle plant, the limit is 0.40 lb/MBtu.
4 The percent reduction requirement is waived for facilities that have a permit limiting annual capacity factor on oil and coal to 30 percent or less.

Table 3

New source performance standards for industrial-commercial-institutional steam generating units larger than 100 MBtu/hr input rate

Subpart D would still apply to any new, fossil-fuel fired steam generating units larger than 250 MBtu/hr heat input rate which is not covered by Subpart Da or Subpart Db. The emission limits under Subpart D are presented in Table 4.

Pollutant	Maximum one hour average emission rate lb/MBtu
Sulfur dioxide[1]	
Liquid fuel	0.80
Solid fuel	1.20
Particulate matter[2]	
Any fuel	0.10
Nitrogen dioxide[1]	
Gaseous fuel	0.20
Liquid fuel	0.30
Solid fuel (except lignite)	0.70
Lignite	0.60 or 0.80

[1] *When combinations of fuel are burned simultaneously, the applicable standard shall be determined by proration.*

Sulfur Oxides: $y\,(0.80) + z\,(1.2) / (x + y + z)$

Nitrogen Oxides $x\,(0.20) + y\,(0.30) + z\,(0.70) / (x + y + z)$

Where x is the percent of total heat input derived from gaseous fuel, y from liquid fuel, and z from solid fuel.

[2] *An opacity limit also exists. Opacity must not exceed 20 percent except for one sixminute period per hour of not more than 27 percent opacity.*

Table 4

New Source Performance Standards for Fossil-Fuel Fired Steam Generating Units Larger Than 250 MBTU/HR Heat Input Rate

Each furnace or boiler is considered a separate unit. The Federal NSPS does not apply to any units less than 100 million Btu/hr. This is the case even if several side-by-side units add up to more than 100 million Btu/hr. Only the state (or local) emission limits apply to small units. State or local emission limits will also apply to the units covered by the Federal NSPS. The facility must be designed to meet the most stringent of the federal or state emission limits. Usually the states have adopted the Federal NSPS but some states do have more restrictive limits for some pollutants, notably SO_2.

5.2 WATER QUALITY REGULATIONS. Wastewater from a power plant is regulated in two separate ways much as air pollutants are regulated. The first method is by water quality standards that are established for water bodies. Discharges to a water body must be analyzed to determine its impact on water quality. The second method is effluent standards for each specified waste stream from the power plant. However, the EPA's regulation of effluents from power plants is limited to generating units at an

establishment primarily engaged in the generation of electricity for distribution and sale, which results primarily from a process utilizing fossil-type fuel or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermohydraulic medium. Therefore, a military installation would not ordinarily be subject to the EPA's effluent guidelines and standards for steam electric power plants. The regulations of the applicable state must be examined for separate effluent regulations. Only water quality standards will be addressed in this section. The major Federal statute regulating water quality and wastewater discharges is the Clean Water Act (CWA). The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The EPA is responsible for administering the CWA. The CWA includes provisions to recognize, preserve, and protect the primary responsibilities and rights of states and for the states to implement permit programs to prevent, reduce, and/or eliminate pollution. The EPA and the States, acting in coordination, are to develop and publish regulations specifying minimum guidelines for public participation in such processes.

5.2.1 WATER QUALITY STANDARDS. The purpose of water quality standards is to define the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. Water quality standards, should wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water, taking into consideration their use and value for public water supplies, agricultural, industrial, and other purposes including navigation. States are to adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the CWA. States are responsible for reviewing, establishing and revising water quality standards. The state adopted standards may be more stringent than required by Federal regulation. Under provision of the CWA, EPA is to review and approve or disapprove the state-adopted water quality standards. There are three main factors to be considered in establishing water quality standards. These factors are designation of uses, criteria and anti-degradation policy.

5.2.1.1 DESIGNATION OF USES. Each state must specify appropriate water uses to be achieved and protected. In designating uses of a water body and the appropriate criteria for those uses, the state must take into consideration the water quality standards of downstream waters and ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters. States may adopt subcategories of a use and set appropriate criteria to reflect varying needs of such subcategories of uses. At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under Sections 301(b) and 306 of the CWA and cost-effective and reasonable best management practices for nonpoint source control. The state shall provide notice and an opportunity for a public hearing prior to adding or removing any use or establishing subcategories of a use. Seasonal uses may be adopted as an alternative to reclassifying a water body to uses requiring less stringent water quality criteria. States may remove a designated use, which is not an existing use, or establish subcategories of a use if the state can demonstrate that attaining the designated use is not feasible because of naturally occurring pollutants concentrations, or natural, ephemeral, intermittent, or low flow conditions or water levels. The state is required to conduct a use attainability analysis unless otherwise exempted in the CWA.

5.2.1.2 CRITERIA. States are required to adopt water quality criteria that protect the designated use of the most sensitive use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. States must identify specific water bodies where toxic pollutants may be adversely affecting water quality, or attainment of a designated water use, or are at a level to warrant concern. Where a state adopts narrative criteria for toxic pollutants, it must provide information identifying the method by which the state intends to regulate point source discharges of toxic pollutants. Toxic pollutants are those listed by the EPA under Section 307(a) of the CWA.

5..2.1.3 ANTI-DEGRADATION POLICY. The state is to develop and adopt a statewide anti-degradation policy and identify the methods for implementing the policy. Where the

quality of the waters exceeds the level necessary for the designated use, that quality will be maintained and protected unless, after the full satisfaction of the intergovernmental coordination and the public participation provisions, the state finds that allowing lower water quality is necessary to accommodate important economic or social development in the area where the waters are located. Where high quality waters constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. Where a potential water quality impairment associated with a thermal discharge is involved, the anti-degradation policy and implementation method must be consistent with Section 316 of the CWA.

5.2.1.4 PUBLIC HEARINGS AND EPA NOTIFICATION. The state must, at least once every three years, hold public hearings for the purpose of reviewing applicable water quality standards and modifying them as appropriate. The state is to submit the results of the review and any supporting analysis for the use attainability analyses to EPA. The methodologies used for site-specific criteria development, any general policies, and revisions to the water quality standards are also to be submitted to EPA for review and approval. After the state submits the officially adopted revisions, EPA notifies the state within 60 days of approval or within 90 days of disapproval. A state water quality standard remains in effect, even though disapproved by EPA, until the state revises its standard or EPA promulgates a rule that supersedes the state standard. If the state does not adopt changes specified by EPA within 90 days after notification of disapproval, EPA will promptly propose and promulgate such a standard. In promulgating water quality standards, EPA is subject to the same policies, procedures, and public participation requirements as established for the states.

5.2.2 PRETREATMENT STANDARDS. EPA has also established pretreatment regulations applicable to any industrial wastewater discharges to publicly-owned sewage treatment works (POTW). The pretreatment regulations prohibit the discharge from causing inhibition or disruption of the receiving POTW's sewer system, treatment

processes, or operations which contribute to a violation of the NPDES permit of the POTW. The pretreatment regulations contain the following specific prohibitions:

a) Discharges cannot contain pollutants which create a fire or explosion hazard.

b) Discharges cannot cause corrosive structural damage to the POTW. In no event can the discharge have a pH less than 5.0, unless the POTW is specifically designed for such discharges.

c) Discharges cannot contain solid or viscous pollutants in amounts which will cause obstruction to the flow in sewers or other interference with the operation of the POTW.

d) Discharges cannot be of such volume or pollutant strength as to interfere with the operation of the POTW.

e) Discharges may not contain heat in amounts which will inhibit biological activity in the POTW, resulting in interference with the proper operation of the POTW.

In no event can the discharge exceed 40 C (104 F), unless specifically approved by the POTW. If the power plant will be discharging to a POTW, then coordination with the POTW will be required to ensure that the facility has the capacity to accept the discharge and to determine the industrial wastewater treatment charges.

5.2.3 OIL SPILL REGULATIONS. Discharges of oil into any stream, river or lake are prohibited by the Clean Water Act if the discharge is considered harmful. Oil discharges are considered harmful to the public health or welfare if they meet either of the following criteria.

a) Cause a violation of applicable water quality standards.

b) Cause a film, sheen upon, or discoloration of the surface of the water or adjoining shorelines, or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.

To minimize the environmental effects of oil spills, a Spill Prevention, Control, and Countermeasure (SPCC) Plan is required if the project would have an aggregate above ground storage capacity of oil which exceeds 1,320 gallons, a single above ground container larger than 660 gallons, or an aggregate underground storage of oil which exceeds 42,000 gallons and which has discharged, or could reasonably be expected to discharge oil in harmful quantities into nearby lakes or streams. Appropriate containment and diversionary structures or equipment to prevent discharged oil from reaching a navigable watercourse should be provided. One of the following systems or its equivalent should be used as a minimum:

a) Dikes, berms, or retaining walls sufficiently impervious to contain spilled oil.

b) Curbing.

c) Culverting, gutters, or other drainage systems.

d) Weirs, booms, or other barriers.

e) Spill diversion ponds.

f) Retention ponds.

g) Sorbent materials.

The SPCC Plan, in addition to a discussion of the method used as the minimal prevention standard, should include a complete discussion of conformance to the following listed guidelines, or if more strict, local regulations:

a) Facility Drainage. Drainage from the diked areas should be restrained by valves to prevent spill or leakage from entering into the drainage system unless it is designed to handle such leakage. Valves used for drainage should open and close only by manual operation.

b) Bulk Storage Tanks. All bulk storage tank installations should be constructed so that a secondary means of containment is provided for the entire contents of tank plus precipitation.

c) Inspection. A procedure for inspection should be incorporated in the plan. A record of the inspection, signed by the appropriate supervisor or inspector, should be made part of the plan and maintained for a period of 3 years.

d) Security. All plants which handle, process and store oil should be fully fenced, and entrance gates should be locked and guarded when the plant is not in production or is unattended. The master flow and drain valves, and any other valves permitting outward flow from the tanks, should be securely locked in the closed position. Facility lighting should be commensurate with the type and location of the facility, and consideration should be given to discovery of spills during darkness and prevention of vandalism.

e) Personnel Training. Each applicable facility should have a designated person who is accountable for oil spill prevention and who reports to line management.

5.3 SOLID WASTE DISPOSAL. The Resource Conservation and Recovery Act of 1976 (RCRA) replaced the Solid Waste Disposal Act. RCRA significantly expanded the scope of the regulatory authority of EPA in the area of hazardous wastes and solid waste disposal practices. The stated objectives of RCRA are to promote the protection of health and the environment, and to conserve valuable material and energy resources. These objectives are to be accomplished by certain steps including the following.

5.3.1 DUMPING. Objective: Prohibiting future open dumping on the land and requiring the conversion of existing open dumps to facilities which do not pose a danger to the environment or to health.

5.3.2 TREATMENT, STORAGE, AND DISPOSAL. Objective: Regulating the treatment, storage, transportation and disposal of hazardous wastes which have adverse effects on health and the environment.

5.3.3 GUIDELINES. Objective: Providing for the promulgation of guidelines for solid waste collection, transport, separation, recovery, and disposal practices and systems. The primary effort to implement RCRA is the task of the individual states. Under RCRA, all solid wastes are divided into two categories; hazardous and nonhazardous. Some wastes are designated specifically as being hazardous while others, including fly ash, bottom ash, and scrubber sludge, are classified as nonhazardous. This exception for coal combustion wastes has been interpreted by EPA to cover other power plant wastes which are treated or disposed of in conjunction with the ash or scrubber sludge wastes. Consequently, the regulatory requirements for disposal of wastes, which otherwise could be classified as hazardous, can currently be simplified by mixing them with coal combustion wastes.

5.3.3.1 HAZARDOUS WASTE. Under RCRA the EPA was required to develop and issue criteria for identifying the characteristics of hazardous waste, and for listing the hazardous wastes which would be regulated. All wastes at a power plant not included within the coal combustion waste exemption must be tested or compared to each of the following generic characteristics of hazardous wastes. If the waste exhibits any of these characteristics, it must be handled as a hazardous waste, unless otherwise exempted.

a) Ignitability.
b) Corrosiveness.
c) Reactivity.
d) Extraction Process Toxicity.

At a power plant, the regeneration wastes from water treatment systems and the metal cleaning wastes can sometimes meet the corrosiveness test with a pH below 2.

5.3.3.2 TOTALLY ENCLOSED FACILITIES. A Hazardous Waste Management Facility (HWMF) permit is not required for any "totally enclosed" facilities used to treat hazardous wastes. A facility is considered "totally enclosed" if the facility is constructed and operated in a manner which prevents the release of any hazardous waste constituent into the environment. A covered neutralization tank is an example of a totally enclosed treatment facility. To qualify for the exception, the neutralization tank must meet the following requirements:

a) The neutralization tank must be in a secure area. A fence with controlled access around the entire generating facility would suffice.

b) The neutralization tank must be inspected for equipment malfunctions or deterioration, operator errors, and discharges of the waste. A written inspection plan and log must be kept.

c) The treatment process must not generate extreme heat or pressure, produce uncontrolled toxic vapors, or pose a risk of fire or explosion. The process must be conducted so as not to damage the structural integrity of the tank.

d) The tank must be constructed of sturdy, leakproof material and must be designed, constructed, and operated so as to prevent hazardous wastes from being spilled or leaked.

e) Any significant spills or leaks of hazardous waste must be reported to the EPA Regional Administrator.

5.3.3.3 NONHAZARDOUS WASTE. RCRA classifies all nonhazardous waste disposal facilities as either sanitary landfills or open dumps. Open dumps are facilities that do not

provide adequate protection for health and the environment. They are unacceptable under RCRA and they were all to be upgraded to a sanitary landfill or phased out within 5 years. Sanitary landfills are disposal facilities that do provide adequate safeguards for health and the environment. All nonhazardous waste disposal facilities, then, must either meet the requirements of a sanitary landfill or must have been closed. EPA has promulgated regulations that define more specifically the difference between sanitary landfills and open dumps. The portions of these regulations that would be applicable to fly ash, bottom ash, or scrubber sludge disposal are as follows:

a) Facilities or disposal practices in a flood plain cannot restrict the flow of a 100-year flood, reduce the temporary water storage capacity of the flood plain, or result in washout of solid waste.

b) Facilities or disposal practices cannot cause or contribute to the taking of any endangered species or result in the destruction or adverse modification of the critical habitat of such species.

c) Facilities of disposal practices cannot cause a pollutant discharge in violation of the NPDES program or a discharge of dredge/fill material in violation of Section 404 or the CWA and the Dredge and Fill Program. Furthermore, facilities or disposal practices cannot cause nonpoint source pollution that violates an approved area-wide or statewide water quality management plan.

d) Facilities or disposal practices cannot contaminate an underground drinking water source beyond the outermost perimeter of the disposed solid waste as it would exist at the completion of all disposal activities.

e) Facilities cannot dispose of wastes containing cadmium within 3 feet of the surface of land used for the production of food-chain crops unless the application of such wastes complies with the complex requirements of 40 CFR Section 257.3-5, Criteria for Classification of solid waste disposal facilities and Practices.

f) Facilities or disposal practices must minimize the population of disease vectors through periodic application of cover material or other techniques as appropriate so as to protect public health.

g) Facilities or disposal practices cannot engage in open burning.

h) The concentration of explosive gases cannot exceed 25 percent of the lower explosive limit for such gases in facility structures and cannot exceed the lower explosive limit at the site boundaries.

i) Facilities or disposal practices cannot pose a hazard to the safety of persons or property from fires.

j) Facilities located within 10,000 feet of any airport runway used by turbojet aircraft or within 5,000 feet of any airport runway used only by piston-type aircraft cannot pose a bird hazard to aircraft.

k) Facilities or disposal practices cannot allow uncontrolled public access to the facility.

In addition to the solid waste regulations already described, EPA has drafted solid waste guidelines to describe recommended considerations and practices for the location, design, construction, operation, and maintenance of solid waste landfill disposal facilities. EPA has issued a proposed set of guidelines for burial of solid waste, (Federal Register Volume 44, page 18138, March 26, 1979) but has not yet issued guidelines for surface impoundments (e.g., ash ponds) or landspreading operations for solid waste disposal. Recommendations are made in the proposed guidelines for landfill disposal of solid waste, in the following areas:

a) Site Selection.
b) Design.
c) Leachate Control.

d) Runoff Control.

e) Operation.

f) Monitoring.

Each area is covered in detail. The current set of guidelines shall be referred to when a solid waste disposal landfill facility is needed.

5.4 DREDGE AND FILL REGULATIONS. The Rivers and Harbors Act of 1899 (RHA) grants authority for the control of structures in navigable waters to the Secretary of the Army and, through delegation, to the Corps of Engineers. Under the command of the Chief of Engineers, the Corps of Engineers administers the civil functions of the Department of the Army. The administrative organization of the Corps of Engineers for the United States and its possessions consists of 11 "divisions" and 36 "districts" based on watershed boundaries of principal rivers or other hydrologic boundary limits. Each Division, headed by a Division Engineer, is subdivided into Districts headed by District Engineers. District Engineers are responsible for all Federal civil works functions within the boundaries of their respective Districts and report to the appropriate Division Engineer. Division Engineers are similarly responsible for civil works functions within their Divisions and report to the Chief of Engineers in Washington, DC. The two major types of activities which are regulated by the Corps are construction work or structure in navigable waters and discharges of dredge or fill material into waters of the United States.

5.4.1 OBSTRUCTION OR ALTERATION. Section 10 of the RHA prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The construction of any structure in or over any navigable water of the United States, the excavation from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters are unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army.

5.4.2 HARBOR LINES. Section 11 of RHA authorizes the Secretary of the Army to establish harbor lines channel-ward of which no pier, wharves, bulk heads, or other works may be extended, or deposits made without approval of the Secretary of the Army.

5.4.3 DISCHARGE OF REFUSE. Section 13 of the RHA provides that the Secretary of the Army, whenever the Chief of Engineers determines that anchorage and navigation will not be injured, may permit the discharge of refuse into navigable waters. In the absence of a permit, the discharge of refuse is prohibited. While the statutory prohibition of this section is still in effect, the Secretary of the Army has waived its Section 13 permit authority in view of the permit authority provided by the EPA Administrator under Sections 402 and 404 of the CWA.

5.4.4 REGULATORY PROGRAM. The Corps has consolidated its civil regulatory functions into one regulatory program so that one permit will constitute the authorization required by all the various statutes administered by the Corps. General categories of activities that are covered by the Corps' Regulatory Program are as follows.

a) Dams or dikes in navigable waters of the United States.

b) Other structures of work including excavation, dredging, and/or disposal activities.

c) Activities that alter or modify the course, condition, location, or capacity of navigable water.

d) Construction of artificial islands, installations, and other devices on the outer continental shelf.

e) Discharges of dredged or fill material into waters of the United States.

f) Activities involving the transportation of dredged material for the purpose of disposal in ocean waters.

The authorization required for activities subject to the Corps' regulatory program can be either a general or individual permit. The Corps of Engineers is authorized to issue general permits on a state, regional, or nationwide basis for a category of activities which are essentially similar in nature, and will cause only minimal adverse environmental effects when performed separately, and will have only minimal cumulative adverse effects on the environment. General permits can be issued on either a nationwide or regional basis. Since a general permit is "automatically" issued upon compliance with certain conditions, a permit application is not necessary to obtain a general permit. However, Division Engineers can override general permits and require the activity to be authorized by an individual permit. Individual permits are issued following a case-by-case review of the project and a determination that the proposed activity is in the public interest.

5.4.5 STATE PERMIT PROGRAM. The individual states may request to administer the dredge and fill permit program within their jurisdiction, but only for ultra-state waters. To request this delegation, the Governor of the state must submit a request to the EPA Administrator which includes a full and complete description of the program the state proposes to administer. EPA will review the application and statutory authority of the state, and will notify the Corps of Engineers when the program has been approved. The Corps of Engineers will transfer to the state pending applications for the state to issue the appropriate permits. The state may also elect to administer and enforce the issuance and enforcement of the general permits issued by the Corps of Engineers. This enforcement will be effective when the state receives approval of its program from EPA and gives notification to the Corps of Engineers. Upon receipt of the notice, the Corps of Engineers will suspend the administration and enforcement of the general permit activities within the state.

5.4.6 EPA GUIDELINES. The EPA dredge and fill guidelines must be used by the Corps of Engineers to evaluate the effects of the proposed discharge of dredge and fill material. The fundamental precept of this review is that the discharge should not be approved unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact. Under these guidelines, the Corps of Engineers cannot issue a permit for the discharge under the following circumstances:

a) No discharge of dredge or fill material can be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

b) No discharge of dredge or fill material can be permitted if it would cause or contribute to a violation of any water quality standard, toxic effluent standard, or any requirement imposed by the US Department of Commerce to protect any marine sanctuary.

c) No discharge of dredge or fill material can be permitted if it jeopardizes the continued existence of any listed endangered or threatened species, or results in the likelihood of the destruction or adverse modification of a critical habitat. If an exemption for the project is obtained from the Endangered Species Committee, then the permit can be issued but must contain the conditions of the exemption.

d) No discharge of dredge or fill material can be permitted which would cause or contribute to significant degradation of any waters of the United States. The guidelines specify that significant adverse effects upon the following items must be considered:

(1) Human health and welfare.
(2) Life stages of aquatic life and other wildlife dependent on aquatic ecosystems.
(3) Aquatic ecosystem diversity, productivity, and stability.
(4) Recreational, esthetic, and economic values.

e) No discharge of dredge or fill material can be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse effects on the ecosystem.

5.5 PERMITS

5.5.1 ENVIRONMENTAL IMPACT STATEMENTS

5.5.1.1 NEPA. The National Environmental Policy Act (NEPA) requires that all major Federal actions which significantly affect the quality of the human environment must be accompanied by an Environmental Impact Statement (EIS) which evaluates the following:

a) The environmental impact of the proposed action.

b) Any adverse environmental effects which cannot be avoided should the proposal be implemented.

c) Alternatives to the proposed actions.

d) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

e) Any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented.

5.5.1.2 CEQ. Federal regulations implementing NEPA have been promulgated by the Council on Environmental Quality (CEQ). A determination must be made whether the Federal action "significantly affects" the quality of the human environment. This determination of the significance of the project's impacts requires consideration of the context and intensity of the effects of the entire project on the environment. This

decision is usually made as a case-by-case basis. An owner may be permitted to prepare an Environmental Assessment (EA) to assist it in making the impact significance determination. An EA should include a brief discussion of the need for the proposed project, project alternatives, the environmental impacts of the proposed projects and its alternatives, and a listing of agencies and persons consulted during the preparation of the EA.

5.5.1.3 ENVIRONMENTAL IMPACT STATEMENTS. If the EA's conclusion is that the proposed project would not significantly affect the human environment, the agency will issue a Finding of No Significant Impact (FONSI) and no EIS is necessary. If the EA concludes that the proposed project will significantly affect the human environment, the agency will proceed to prepare an EIS.

5.5.1.4 FEDERAL REGISTER. A federal agency that commits itself to prepare an EIS, it must publish a notice of such intent in the Federal Register describing the proposed action, possible alternatives, and the scoping process. The notice should include whether, when, and where any scoping meeting will be held, and state the name and address of a person within the agency who can answer any questions concerning the action.

5.5.1.5 FORMAT. The CEQ regulations specify the following format and general information categories to be contained in an EIS.

a) Cover Sheet - This single page must include a list of all agencies involved in the EIS preparation; the title of the proposed action; the name, address, and telephone number of the person to contact for more information; a designator of whether the EIS is a draft, final, or draft/final supplement; a one paragraph abstract; and the date by which comments must be received.

b) Summary - This section must accurately and adequately summarize the EIS and must stress the major conclusions and any remaining issues to be resolved.

c) Purpose and Need - This section must briefly specify the underlying purpose and need for the project.

d) Alternatives - This section should compare the environmental impacts of the proposal and the alternatives. All reasonable alternatives must be rigorously explored and objectively evaluated. The reasons behind the elimination of any alternative must be disclosed. These alternatives must include the alternative of no action and all reasonable alternatives not within the jurisdiction of the agency. Each remaining alternative must be considered and discussed in depth. The preferred alternative must be identified. Appropriate mitigation measures must be included.

e) Affected Environment - This section must sufficiently describe the environment of the area(s) to be affected or created by the alternatives under consideration.

f) Environmental Consequences - This section must include a discussion of the environmental impacts of the proposal and its alternatives, any adverse environmental effects which cannot be avoided, the relationship between the short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitment of resources. The discussion should include direct and indirect effects and their significance, possible conflicts between the proposal and the objectives of any affected governmental unit, environmental effects, energy and natural or depletable resource requirements and conservation potentials. Also include urban quality, historic, and cultural resources and the design of the built environment, including the reuse and conservation potentials and mitigation measures.

g) List of preparers

h) Index.

i) Appendices - This section consists of material which is prepared for, substantiates, or is incorporated by reference in the EIS.

5.5.1.6 DRAFT EIS. When the draft EIS is completed, it is filed with EPA. The EPA then files a copy with the Council and publishes a notice in the Federal Register of the filing.

5.5.1.7 COORDINATION. The draft EIS is circulated to any other Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved; to any Federal, state, or local agency authorized to develop and enforce environmental standards; and to anyone requesting the EIS. The minimum comment period is 45 days.

5.5.1.8 RESOLUTION. The owner must respond in the final EIS to all comments upon the draft EIS. Possible responses are modifications to the alternatives including the proposal; development and evaluation of new alternatives; supplements, improvements, or modifications to its analyses; factual corrections; and explanations why the comment(s) did not warrant further owner response.

5.5.1.9 FINAL COMMENT. The final EIS must also be circulated for comments to all those who received copies of the draft as well as to those who made substantive comments upon the draft EIS. The final EIS for a federal project is filed with the EPA. The EPA then files a copy with the Council and publishes a notice in the Federal Register of the filing.

5.5.1.10 TIME PERIOD. A federal agency must consider its decision for at least 90 days after the Federal Register notice of the filing of the draft EIS or 30 days after the Federal Register notice of the filing of the final EIS, which is later. These periods may run concurrently.

5.5.2 AIR PERMITS

5.5.2.1 NEW SOURCE PERMITS. A permit under the Federal Clean Air Act may be required. This permit is called a "new source review" although it is also frequently called a "PSD permit" for prevention of significant deterioration. Actually a new source

review can involve both a PSD permit and a nonattainment review. The permit is required before construction begins on the power plant. The new source review is a rather complex process. A number of steps must be accomplished for each pollutant to be emitted. Different pollutants may take different paths through the process even though they may be from the same source. For instance, if the area where the source is located is attainment for sulfur dioxide but nonattainment for particulate matter, then $S0_2$ will follow PSD requirements while particulate matter will follow the nonattainment path of offsets and Lowest Achievable Emission Rate (LAER). The PSD program is triggered in clean air areas where the proposed unit is larger than 250 million Btu per hour heat input rate and has a potential to emit 100 tons per year or more of SO_2, NOx, or particulate matter. If the unit is less than 250 million Btu per hour heat input rate, it will not be regulated under the PSD program unless it has the potential to emit 250 tons per year or more of any of the pollutants. However in this case the emission from separate new units or modifications on the same site will be added together. Even if a unit is not subject to the Federal NSPS, it may need a PSD permit. Conversely, a unit may be subject to the NSPS but not need a PSD permit.

5.5.2.2 PURPOSE. The purpose of the PSD Program is to ensure that new major sources of air pollution do not significantly degrade existing ambient air quality. In order to achieve this goal, construction of a new major source cannot commence until after receiving approval from EPA or a state which has been delegated PSD authority by EPA. The following requirements must be fulfilled before a PSD permit can be issued:

a) Appropriate emission limitations have been established.

b) The proposed permit has been duly reviewed and a public hearing is held with opportunity for interested persons to appear and submit written or oral presentations on the air quality impact of the source, alternatives, control technology requirements, and other appropriate considerations.

c) Emissions from construction or operation of the facility must be shown not to cause or contribute to air pollution in excess of the allowable increments or allowable concentration more than once per year, any national ambient air quality standard, or any applicable emission standard or standard of performance.

d) The facility is subject to best available control technology.

e) Class I areas are protected.

f) An analysis of air quality impacts projected for the area as a result of growth associated with the facility is performed.

g) An agreement is reached to conduct necessary ambient air quality monitoring.

5.5.2.3 DE MINIMIS AMOUNTS. Once a unit is determined to require a PSD permit, then the review will extend to all pollutants which exceed the following "de minimis" amounts:

Pollutant	Emission rate, tons/year
Carbon monoxide	100
Nitrogen oxides	40
Sulfur dioxide	40
Particulate matter	
Total	25
PM-10	15
Ozone (volatile organic compounds)	40
Lead	0.6
Asbestos	0.007
Beryllium	0.0004
Mercury	0.1
Vinyl chloride	1
Fluorides	3
Sulfuric acid mist	7
Hydrogen sulfide (H_2S)	10
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (including H_2S)	10

5.5.2.4 BEST AVAILABLE CONTROL TECHNOLOGY. One of the PSD permit requirements listed earlier was that the facility must be designed in accordance with

best available control technology (BACT). BACT requires the imposition of emission controls capable of at least complying with the applicable new source performance standards and with all applicable state emission limitations. Frequently, the BACT review will result in a permitted emission limit less than the new source performance standards. The BACT requirement will be applied on a pollutant-by-pollutant basis. BACT is required for each pollutant emitted by a major source if the allowable emissions are in excess of de minimis amounts specified above.

5.5.2.5 CLASS I AREAS. A PSD permit will not be issued if the proposed source will have an adverse impact on visibility within any protected Class I area or integral vista. An adverse impact on visibility is defined as visibility impairment which interferes with the management, protection, preservation, or enjoyment of a visitor's experience of a mandatory Class I area.

5.5.2.6 AMBIENT AIR DATA. An analysis of ambient air quality at the site must be conducted as part of the PSD review. Consequently, the PSD permit application must contain continuous air quality monitoring data for each pollutant emitted in excess of the de minimis amounts. However, the monitoring requirement is waived for any pollutant if the emissions from the proposed source would have maximum modeled air quality impacts less than certain amounts specified by the EPA. Although a year of monitoring data is usually required, a shorter period of data can be accepted if a complete and adequate analysis can be performed. The EPA regulations specify that at least 4 months of monitoring data are required. EPA is granted a period of one year from receipt of a complete PSD permit application to make a final determination. EPA will examine the initial PSD permit application and within 30 days will advise the applicant of any deficiency in the application or additional information required. In the event of a deficiency, the date of receipt of the application is the date all information is provided, and not the initial filing date. The general outline for consideration and issuance of the approval is as follows.

a) A preliminary determination is made to approve, approve with conditions, or disapprove the request.

b) Make available all materials provided by applicant, a copy of preliminary determination, and other materials used.

c) Notify public of the application, determination, and amount of increment consumed, and advise of opportunity for hearing.

d) Send a copy to other Federal, state, and local agencies.

e) Provide opportunity for public hearing on air quality impact, alternative to the source, the control technology required, and other appropriate considerations.

f) Consider all comments and issue final determination.

5.5.2.7 NONATTAINMENT AREAS. If the project's emissions significantly affect ambient concentrations of a nonattainment pollutant within the nonattainment area, the project will be subject to a nonattainment review for that pollutant. The project's emissions are deemed to significantly affect a nonattainment area if the ambient air quality impact of those emissions exceeds the values shown in Table 5.

Pollutant	Averaging times				
	Annual	24-hour	8-hour	3-hour	1-hour
SO_2	1.0	5		5	
TSP	1.0	5			
NOx	1.0				
CO			500		2,000

Table 5

Significant levels (in micrograms per cubic meter)

The following demonstrations are required by a nonattainment review.

a) The project will comply with the lowest achievable emission rate (LAER). LAER is defined as the more stringent of 1) the most stringent emissions limitation imposed by any state on a similar source unless proven not to be achievable, or 2) the most stringent emissions limitation achieved in practice by a similar source.

b) The owner or operator of the proposed source must demonstrate that all major stationary sources owned or operated by such person (or by an entity controlling, controlled by, or under common control with such person) in the state are subject to emission limitations and are in compliance, or on a schedule for compliance, with all applicable Federal and state emission limitations and standards.

c) The owner or operator of the proposed source must obtain sufficient emission reductions to offset the impacts within the nonattainment area of the source's emissions of the nonattainment pollutant. Air quality modeling must predict the emission offsets will cause a positive net air quality benefit in that portion of the nonattainment area affected by emissions from the proposed source.

d) The most stringent emissions limitation imposed by any state on a similar source unless proven not be achievable.

e) The most stringent emissions limitation achieved in practice by a similar source.

5.5.2.8 LOCAL PERMITS. A separate state or local construction and operating permit may be needed for the power plant. Consult the air pollution control agency in the state where the power plant will be built.

5.5.3 WASTEWATER DISCHARGE PERMIT. Any point source discharge of a pollutant to the navigable waters not authorized by a National Pollution Discharge Elimination System (NPDES) permit is unlawful. Permits will be issued by EPA only if the applicable effluent limitations are met.

5.5.3.1 STATE PERMIT PROGRAM. EPA may authorize a state to carry out the provisions of the permit program if the state can show it has enacted legislation and regulations to conform to the guidelines promulgated by EPA. About thirty of the states have been approved for this delegation. In these not approved, both the NPDES permit and a separate state wastewater discharge permit will be required.

5.5.3.2 FEDERAL LICENSE OR PERMIT. Applicants for a Federal license or permit to conduct any activity which may result in any discharge into the navigable waters are required to provide the permitting agency a certification, from the state in which the discharge originates, that any such discharge will comply with applicable provisions of the Clean Water Act (CWA). In any case where a state or interstate agency has no authority to give such a certification, the certification should be from the EPA Administrator. No license or permit may be granted until the certification has been obtained or waived by the appropriate agency. EPA, when issuing a permit, is authorized to prescribe conditions on the permit to assure compliance with applicable effluent limitations including conditions on data and information collection, reporting, and other such requirements as it deems necessary. EPA is directed to promulgate guidelines for determining the degradation of the waters of the territorial seas, the contiguous zone, and the oceans. No NPDES permit will be issued except in compliance with these guidelines for discharges into water of these seas, contiguous zones, or oceans.

5.5.3.3 NEW SOURCE. Any person who proposes to discharge pollutants and does not have an effective permit must complete an NPDES application. EPA has specified that the following construction activities result in a new source.

a) Construction of a source on a site at which no other source is located, or

b) Construction on a site at which another source is located of a building, structure, facility, or installation from which there is or may be a discharge of pollutants, the process or production equipment that causes the discharge of pollutants from the

existing source is totally replaced by this construction, or the construction results in a change in the nature or quantity of pollutants discharged.

c) Construction on a site at which an existing source is located results in a modification rather than a new source if the construction does not create a new building, structure, facility, or installation from which there is or may be a discharge of pollutants but otherwise alters, replaces, or adds to existing process or production equipment.

Construction of a new source is considered to have commenced when the owner or operator has begun or caused to begin as part of a continuous on-site construction program:

a) Any placement, assembly, or installation of facilities or equipment.

b) Significant site preparation work which is necessary for the placement, assembly, or installation of new source facilities or equipment.

c) Entering into a binding contractual obligation for the purchase of facilities or equipment which are intended for use in its operation within a reasonable time.

5.5.3.4 ENVIRONMENTAL IMPACT STATEMENT. No on-site construction of a new source, for which an Environmental Impact Statement (EIS) is required, is to commence before all appropriate EIS-related requirements have been incorporated in the project and a final permit is issued, or, before execution of a legally binding written agreement by the applicant requiring compliance with all such requirements, unless EPA determines that such construction will not cause significant or irreversible adverse environmental impact. No on-site construction of a new source for which an EIS is not required may commence until 30 days after the issuance of a finding of no significant impact unless EPA determines that the construction will not cause significant or irreversible adverse environmental impact.

5.5.3.5 VIOLATION OF REGULATIONS. The permit applicant must notify EPA of any on-site construction which begins before the above specified times. If on-site construction begins in violation of regulations, the owner or operator is proceeding at its own risk and such construction activity constitutes grounds for denial of a permit. EPA may also seek a court order to enjoin construction in violation.

5.5.3.6 STORM SEWERS AND CONVEYANCES. Separate storm sewers are point sources subject to the NPDES permit program which may be permitted either individually or under a general permit. Separate storm sewer is defined as a conveyance or system of conveyances (including pipes, conduits, ditches, and channels) used primarily for collecting and conveying storm water runoff. Conveyances which discharge storm water runoff contaminated by contact with wastes, raw materials, or pollutant-contaminated soil, from lands or facilities used for industrial or commercial activities, into waters of the United States or into separate storm sewers are point sources that must obtain NPDES permits.

5.5.3.7 FILING DATE. EPA requires an application for a NPDES permit to be filed at least 180 days before the discharge is to begin. However, in view of the environmental review required of new sources, EPA recommends filing much earlier.

5.5.3.8 NPDES PERMIT. The NPDES permit application consists of two consolidated forms. Form 1 is a general information form about the applicant; the proposed facility. The other part of the NPDES permit application for a proposed facility is to adapt Form 2C (for existing facilities) to reflect the fact that there are no discharges from the project yet.

EPA will not issue an NPDES permit under any of the following circumstances:

a) When the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA.

b) When the applicant is required to obtain a state or other appropriate certification under Section 401 of the CWA and that certification has not been obtained or waived.

c) When the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected states.

d) When in the judgment of the Corps of Engineers, anchorage and navigation in or on any of the waters of the United States would be substantially impaired by the discharge.

e) For the discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste.

f) For any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

g) To a new source of a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards. A NPDES permit will be issued for a term not to exceed five years. The conditions of an NPDES permit issued to a source which is subject to a new source performance standard (NPDES) cannot be made more stringent for the shortest of the following intervals:

(1) Ten years from the date that construction is completed.

(2) Ten years from the date the source begins to discharge process or other non-construction-related wastewater.

(3) The period of depreciation or amortization of the facility for the purposes of Section 167 or 169 (or both) of the Internal Revenue Code of 1954.

However, the protection from more stringent conditions does not extend to limitations not based upon technological considerations (e.g., conditions based upon compliance

with water quality standards or toxic effluent standards) or to toxic/hazardous pollutants not subject to any limitation in the applicable new source performance standard.

5.5.3.9 NPDES PERMIT CONDITIONS. The following conditions are applicable to all NPDES permits.

a) The permittee must comply with all conditions of the permit. Failure to do so is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. Violation of any permit condition will not be excused on the grounds that it would have been necessary to halt or reduce the permitted activity in order to remain in compliance.

b) The permittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the permit.

c) The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This condition requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

d) The permit does not grant any property rights or any exclusive privilege.

e) The permittee must allow EPA or its authorized representative, upon the showing of any documents required by law, to conduct the following actions:

(1) To enter upon the permittee's premises.
(2) To have access to and copy any records required by the permit.

(3) To inspect any activities regulated by the permit.
(4) To sample any waste streams regulated by the permit.

f) The permittee must provide EPA with any requested information pertinent to any permit action contemplated by EPA.

g) All samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

h) All monitoring records must be kept for a minimum of three years. This period can be extended by EPA. Monitoring records include the following data:

(1) The date, exact place, and time of sampling or measurements.
(2) The individual(s) who performed the sampling or measurements.
(3) The date(s) analyses were performed.
(4) The individual(s) who performed the analyses.
(5) The analytical techniques or methods used.
(6) The results of such analyses.

i) The permittee must notify EPA of any planned changes to the facility, any anticipated noncompliance, and any permit transfer. Any noncompliance which may endanger health or the environment must be reported verbally to EPA within 24 hours and a written report must be submitted within five days.

j) All monitoring must be conducted according to test procedures approved by 40 CFR 136, Guidelines establishing test procedures for the analysis of pollutants, unless other procedures are specifically approved by EPA.

j) All monitoring results must be reported on a Discharge Monitoring Report. All averages must be done on an arithmetic basis. All results must be reported.

k) Any unanticipated bypass or upset which exceeds any permit effluent limitation must be reported to the EPA within 24 hours.

Noncompliance caused by a bypass can be an actionable violation, but noncompliance caused by an upset will always be excused. A bypass is an intentional diversion of a waste stream from any portion of a treatment facility when there are no feasible alternatives to bypassing and it is necessary to bypass in order to avoid loss of life, personal injury, or severe property damage. An upset is an exceptional incident in which there is unintentional and temporary noncompliance with technologically-based effluent limitation because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance caused by lack of preventive maintenance; careless or improper operation; or lack of backup equipment for use during normal periods of equipment downtime or preventive maintenance. The permit can also require reporting within 24 hours of violation of a maximum daily discharge limitation for any pollutant of special concern to EPA. The permit will specify requirements concerning the monitoring equipment (e.g., proper use, maintenance, and installation), monitoring activities (e.g., type, intervals, and frequency), and the reporting of monitoring results. The permit will contain requirements to monitor the mass (or other measurement related to any effluent limitation) for each pollutant regulated by the permit, the volume of effluent discharged from each outfall and any other relevant information.

5.5.4 OIL SPILL PLAN. A Spill Prevention, Control, and Countermeasure (SPCC) Plan is required if the project would have an aggregate underground-aboveground storage capacity of oil which exceeds 1,320 gallons, a single aboveground container larger than 660 gallons, or an aggregate underground storage of oil which exceeds 42,000 gallons and which has discharged, or could reasonably be expected to discharge oil in harmful quantities into nearby lakes or streams. Almost all power plants have this much oil after transformer oils and lube oils are considered. The SPCC Plan need not be submitted but merely available to the EPA for inspection at the plant. The SPCC must be prepared within 6 months after the plant begins operation and must be implemented not later than one year after the plant begins operations. If the plan is not completed on

time, a request can be made to the EPA Regional Administrator for an extension. The plan must be reviewed by a registered Professional Engineer (PE), and he must attest that the SPCC Plan has been prepared in accordance with good engineering practices. EPA has proposed revisions to the SPCC Plan regulations. The changes would require the SPCC Plan to be fully implemented when the plant begins commercial operation. The PE certification would also include a statement that the SPCC Plan conforms to the requirements of EPA's regulations. Where experience indicates a reasonable potential for equipment failure (such as tank rupture, overflow, or leakage), the plan should include a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each major type of failure.

5.5.5 SOLID WASTE DISPOSAL PERMIT. If any hazardous wastes are stored, treated, or disposed of by methods other than those described above, a Hazardous Waste Management Facility (HWMF) permit must be obtained from EPA. Compliance with the following requirements is a prerequisite for obtaining the permit:

a) The HWMF must be in a secure area.

b) The HWMF must be inspected for equipment malfunctions or deterioration, operator errors, and discharges. A written inspection plan and log must be kept.

c) Unless EPA agrees that such equipment is not necessary, the HWMF must have an alarm system to warn personnel of emergencies, a method of summoning emergency assistance, and access to emergency equipment.

d) A contingency plan must be prepared. The contingency plan must be designed to minimize hazards of human health and the environment from fires, explosions, or any unplanned release of hazardous waste.

e) A written operating record is required, and a biannual report must be filed with EPA.

f) All personnel must be trained to handle the hazardous waste safely and in compliance with all permit requirements and conditions.

g) All hazardous waste management activities must be conducted at least 200 feet from any fault which has had displacement in the Holocene time. Facilities in jurisdictions other than those listed in Appendix VI of 40 CFR 264 are assumed to comply with this requirement.

h) All hazardous waste management facilities located in a 100-year flood plain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless washout of the waste would have no adverse effects on human health or the environment, or unless the waste can be safely moved to an upland site before flood waters can reach the facility.

i) A ground water monitoring program meeting the requirements of 40 CFR 264.98 is required for any surface impoundment, waste pile, land treatment facility, or landfill which handles hazardous waste unless EPA determines that there is no potential for migration of leachate from the hazardous waste facility to the uppermost aquifer, or unless the facility is exempted from ground water monitoring because of its design (e.g., landfills are exempted from ground water monitoring if they have a double liner system located entirely above the seasonal high water table, a leak detection system located between the liners, and a leachate collection and removal system located on top of the uppermost liner).

j) A written closure plan must be prepared. The closure plan should minimize the need for further maintenance and the post closure escape of hazardous waste constituents.

k) A written estimate of the cost of implementing the closure plan and of post-closure monitoring and maintenance must be prepared. Financial assurance for closure of the HWMF must be provided through a trust fund, surety bond, letter of credit, insurance, a combination thereof, or self-insurance.

l) The HWMF must be covered by liability coverage in the amount of at least $1 million (exclusive of legal defense costs) for claims arising from sudden and accidental occurrences that cause injury to persons or property. The HWMF must also have liability coverage in the amount of at least $3 million per occurrence with an annual aggregate of at least $6 million (exclusive of legal costs) for claims arising from non-sudden accidental occurrences that cause bodily injury or property damage. This liability coverage can be provided by liability insurance and/or self-insurance.

m) Landfills and surface impoundments used to store, treat, or dispose of hazardous waste must have a ground water protection plan unless the facility has a double liner equipped with a leak detection system or the EPA deter mines that there is no potential for migration of liquid from the facility to the uppermost aquifer. The ground water protection plan must consist of the following three phases:

(1) A ground water sampling program to detect the presence of leachate containing hazardous constituents at the compliance point.

(2) If leachate is detected, a compliance ground water monitoring program must be initiated.

(3) Whenever a ground water protection standard is exceeded, a corrective action program must be initiated.

The EPA has also issued the following regulations governing waste handling practices or equipment at new HWMFs:

a) Containers--40 CFR 264.170 to 264.178.
b) Tanks--40 CFR 264.190 to 264.199.
c) Surface Impoundments--40 CFR 264.220 to 264.230. INACTIVE
d) Waste Piles--40 CFR 264.250 to 264.258.
e) Land Treatment--40 CFR 264.270 to 264.282.

f) Landfills--40 CFR 264.300 to 264.316.
g) Incinerators-- 40 CFR 264.340 to 264.351.

An estimate of the scope of the future regulations for other specific waste handling practices can be made upon examination of the following regulations for existing HWMFs:

a) Thermal Treatment--40 CFR 265.373 to 264.382.
b) Chemical, Physical, and Biological Treatment--40 CFR 265.405.
c) Underground Injection--40 CFR 265.430.

Nonhazardous solid waste disposal permits will be issued by the State where the facility is located. The states standards and permit requirements will need to be examined for specific details applicable to any proposed facility.

5.5.6 DREDGE AND FILL PERMIT. Dredge and fill permits for the Corps of Engineers may be of three types: Nationwide permits, regional permits, and individual permits. The first two types authorize dredge and fill without having to obtain specific approval provided all appropriate conditions and notifications are met. The third type, the individual permit, must be applied for when neither of the other two are available. In assessing the applicability of the Corps' regulatory program to a proposed project activity, the following definitions should be utilized:

a) Waters of the United States--This term includes the following waters:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

(2) All interstate waters including interstate wet lands.

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce, including any such waters which are or could be used by interstate or foreign travels for recreational or other purposes, or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce, or which are or could be used for industrial purposes by industries in interstate commerce.

(4) All impoundments of waters otherwise defined as waters of the United States.

(5) Tributaries of any of the above waters.
(6) The territorial sea.

(7) Wetlands adjacent to any of the above waters.

Note: Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA, are not waters of the United States. Cooling ponds, as defined by 40 CFR 123.11(m), which also meet the criteria of this definition may be waters of the United States.

b) Navigable Waters--This term means those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (see 33 CFR 329 for a more complete definition).

c) Wetlands--This term means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

d) Adjacent--This term means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by manmade dikes or barriers, natural river berms, beach dunes, and the like are "adjacent wetlands."

e) Lakes--This term means a standing body of water that occurs in a natural depression fed by one or more streams from which a stream may flow, that occurs due to the widening or natural blockage or cutoff of a river or stream, or that occurs in an isolated natural depression that is not a part of a surface river or stream, or tidal area. (Artificial lakes created by excavating or diking dryland to collect and retain water for stock watering, irrigation, settling basins, cooling, or rice growing are not included.)

f) Ordinary High Water Mark--This term means the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas.

g) High Tide Line--This term means the line or mark left upon tide flats, beaches, or along shore objects that indicate the intersection of the land with the water's surface at the maximum height reached by a rising tide. The term includes spring high tides and other high tides that occur with periodic frequency, but does not include storm surges.

h) Headwaters--This term means the point on a national stream above which the average annual flow is less than 5 cubic feet per second. For intermittent streams, the criterion may be the median flow. That is, the point at which a flow of 5 cubic foot per second is equaled or exceeded 50 percent of the time.

i) Structure--This term means, without limitation, any pier, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction.

j) Dams and Dikes--Either term means an impoundment structure, except a weir, that completely spans a navigable water of the United States and that may obstruct interstate waterborne commerce.

k) Work--This term means any dredging or disposal of dredged material, excavation, filling, or other modification of a navigable water of the United States.

l) Dredged Material--This term means any material dredged or excavated from waters of the United States.

m) Discharge of Dredged Material--This term includes the addition of dredged material to a specified discharge site located in waters of the United States, and runoff from or overflow from a contained land or water disposal area.

n) Fill Material--This term includes any material used for the primary purpose of replacing an aquatic area with dryland or of changing the bottom elevation of any body of water. (The discharge of wastewater is not considered fill material and is regulated by the NPDES Permit Program.)

o) Discharge of Fill Material--This term means the addition of any fill material to waters of the United States. Generally, any fill material required in connection with construction of facilities in waters of the United States is considered a discharge of fill material.

5.5.6.1 NATIONWIDE PERMITS. Discharges of dredge and fill material into the following waters are authorized by a nationwide permit: 1) Non-tidal rivers, streams, and their lakes and impoundments, including any adjacent wetlands, that are located above the headwaters, and 2) Other non-tidal waters that are not part of a surface tributary system to interstate or navigable waters. However, a state can revoke a nationwide permit by refusing to grant the water quality certification required by Section 401 of the CWA. This type of nationwide permit requires compliance with the following conditions.

a) The discharge of dredge and fill material must not destroy a threatened or endangered species as identified under the Endangered Species Act or endanger the critical habitat of such species.

b) The discharge of dredge or fill materials must consist of suitable material free from toxic pollutants in other than trace quantities.

c) The fill created by the discharge of dredge or fill materials must be properly maintained to prevent erosion and other nonpoint sources of pollution.

d) The discharge of dredge or fill materials must not occur in a component of the National Wild and Scenic Rivers System or in a component of a state wild and scenic river system.

e) The best management practices listed later in this section should be followed to the maximum extent practicable.

18.5.6.2 ACTIVITIES AUTHORIZED BY A NATIONWIDE PERMIT

a) The placement of aids to navigation and regulatory markers which are approved by and installed in accordance with the requirements of the US Coast Guard.

b) The repair, rehabilitation, or replacement of a previously authorized facility. The facility must be currently serviceable, the work must not result in significant deviations from the original plans, and the uses of the facility must not have been changed. Maintenance dredging is not authorized by this nationwide permit.

c) Staff gages, tide gages, water recording devices, water quality testing and improvement devices, and similar scientific structures.

d) Survey activities including core sampling, seismic exploratory operations, and plugging of seismic shot holes and other exploratory-type bore holes.

e) Outfall structures and associated intake structures where the effluent from that outfall has been permitted under the NPDES program providing that the individual and cumulative adverse environmental effects of the structure itself are minimal. (Intake structures by themselves are not included--only those directly associated with an outfall structure are covered by this nationwide permit.)

f) The discharges of material for backfill and bedding for utility lines and outfall and intake structures if no change in preconstruction bottom contours occur and excess material is removed to an upland site. ("Utility line" includes pipelines, communications cables, and electrical transmission lines. This nationwide permit does not include Section 10 authorization, and an individual Section 10 permit will be required if in navigable waters of the United States.)

g) Bank stabilization activities for erosion control if less than 500 feet long and involving less than 1 cubic yard per running foot of bank. Furthermore, no material can be placed in a wetland, water flows into and out of wetlands cannot be impaired, the material must be "clean fill," and the activity must be a single and complete project.

h) Temporary and permanent minor road crossing fills of a non-tidal body of water if designed so that the crossing can withstand expected high flows of surface water and will not restrict such flows. Discharge of material must total less than 200 cubic yards below ordinary high water mark and extend into adjacent wetlands no more than 100 feet from the ordinary high water mark on either side. (If located in a navigable water of the United States, the crossing will require a permit from the US Coast Guard.)

i) The placement of fill incidental to the construction of bridges across navigable waters of the United States if the fill has been authorized by the US Coast Guard as part of the

bridge permit. Causeways and approach fills are not included and will require individual or regional permits.

j) Return water from a contained dredged material disposal area if the state has issued a Section 401 water quality certification. (The dredging itself requires an individual permit if it occurs in navigable waters of the United States.)

k) Fill material for small hydroelectric projects of not more than 1,500 kW which are licensed by the Department of Energy (DOE) under the Federal Power Act. The project must qualify for the short-form Federal Energy Regulatory Commission (FERC) licensing procedures of DOE and the adverse environmental effects must be minimal.

l) Discharges of dredged or fill material of 10 cubic yards or less into waters of the United States if no material is placed in a wetland.

m) Dredging of 10 cubic yards or less from navigable waters of the United States as part of a single and complete project.

n) Structures, work, and discharges authorized by the Department of the Interior, Office of Surface Mining for surface coal mining if the District Engineer has had the opportunity to review the application and other pertinent documentation, and he determines that the individual and cumulative adverse effects are minimal.

o) Activities, work, and discharges included under categorical exclusions from environmental documentation by other federal agencies if the Office of the Chief of Engineers has been notified of the exclusion and agrees with it.

p) Any activity authorized by a state administered dredge and fill permit program approved by the Corps of Engineers.

q) The discharge of concrete into tightly sealed forms or cells where the concrete is used as a structural member which would otherwise not be subject to the jurisdiction of the Corps of Engineers.

5.5.6.3 ACTIVITY-SPECIFIC CONDITIONS. In addition to complying with any activity-specific conditions discussed above, compliance with the following special conditions is required for any of the above nationwide permits for specific activities to be valid:

a) The discharge of dredge or fill material will not be located in the proximity of a public water supply intake.

b) The discharge of dredge or fill material will not occur in areas of concentrated shellfish production.

c) The activity will not destroy a threatened or endangered species as identified under the Endangered Species Act, or endanger the critical habitat of such species.

d) The activity will not disrupt the movement of those species of aquatic life indigenous to the body of water.

e) The discharge of dredge or fill material will consist of suitable material free from toxic pollutants in other than trace quantities.

f) The fill or structure will be properly maintained to prevent erosion and other nonpoint source of pollution.

g) The activity will not occur in a component of the National Wild and Scenic River System or in a component of a state wild and scenic river system.

h) The activity will not cause an unacceptable interference with navigation.

i) The best management practices listed below should be followed to the maximum extent practicable.

5.5.6.4 MANAGEMENT PRACTICES. The best management practices for nationwide permit must be followed to the maximum extent practicable for both the nationwide permits in certain waters and nationwide permits for specific activities:

a) Discharges of dredge or fill material into waters of the States should be avoided or minimized through the use of other practical alternatives.

b) Discharges of dredge or fill material in spawning areas during spawning seasons should be avoided.

c) Discharges of dredge or fill material should not restrict or impede the movement of indigenous aquatic species or the passage of normal or expected high flows, or cause the relocation of water (unless that is the primary purpose of the activity).

d) If the activity creates an impoundment, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow should be minimized.

e) Discharges of dredge or fill material in wetlands area should be avoided.

f) Heavy equipment working in wetlands should be placed on mats.

g) Discharges of dredge or fill material into breeding areas for migratory waterfowl should be avoided.

h) All temporary fills should be removed in their entirety.

5.5.6.5 REGIONAL PERMITS. Each Division Engineer is authorized to issue general permits for activities within his jurisdiction (i.e., regional permits) which meet the general criteria for a nationwide permit category (e.g., minimal cumulative environmental impact), but which cannot qualify for any promulgated nationwide permit category. The Division Engineer is also authorized to issue regional permits modifying any nationwide permit category by adding conditions applicable to certain activities or specific geographic areas within his division. As with nationwide permits, the Division Engineer can revoke a regional permit and require an individual permit for any activity.

5.5.6.6 INDIVIDUAL PERMITS. Individual permits are required for activities not authorized by either a nationwide or regional general permit or not exempted from the Corps' regulatory program. Applications for individual permits must be prepared using the prescribed application form, ENG Form 4345, OMB Approval OMB 49-R0420. The completed application should be submitted to the District Engineer in charge of the Corps of Engineers District where the proposed activity will occur. Local variations of the application form to facilitate coordination with state and local agencies may be encountered. Items taken into consideration when reviewing an individual permit are as follows:

a) The Corps' general approach in evaluating applications for individual permit authorizations required by its regulatory program can be described as a public interest balancing process which reflects national concerns for both the protection and utilization of important resources. This public interest review is based upon an evaluation of the probable impact, including cumulative effects, of the proposed activity and its intended use on the public interest. As part of this evaluation, the benefits which reasonably may be expected to accrue from the proposal will be balanced against its reasonably foreseeable detriments. The following general criteria will be considered during the balancing process:

(1) Public and private need for the proposed structure or work.
(2) Availability of reasonable alternatives.

(3) Extent and duration of beneficial and/or detrimental effects.

b) The Corps strongly discourages activities which adversely affect any wetlands considered to perform any of the following important functions:

(1) Wetlands which serve significant natural biological functions, e.g., wetlands habitat for aquatic or terrestrial species.
(2) Wetlands which have been set aside as study areas, refuges, or sanctuaries.
(3) Wetlands which have significant hydrological characteristics.
(4) Wetlands which shelter other areas from wave action, erosion, or storm damage.
(5) Wetlands which provide valuable storage area for storm and floodwaters.
(6) Wetlands which are prime natural recharge areas for ground water.
(7) Wetlands which provide natural filtration and purification of water.

c) Evaluation of any wetlands alterations must show that the benefits of the proposed alteration outweigh unavoidable damage to the wetlands. When performing this evaluation, the District Engineer must consider whether the proposed activity is dependent on being located in, or in proximity to, the wetlands and whether practicable alternative sites are available. The District Engineer's decisions will be weighted by Congressional policy expressed in the Estuary Protection Act and state wetlands program.

d) The Division Engineer will consult with and give great weight to the views of the US Fish and Wildlife Service, National Marine Fisheries Service, and their state counterparts concerning minimizing direct and indirect losses and damages to wildlife resources caused by the proposed activity.

e) The Corps will review the permit application to evaluate whether the proposed activity will comply with water quality standards and any applicable effluent limitations. The water quality certification required by Section 401 of the CWA is considered conclusive

with respect to water quality considerations unless the EPA mandates that other water quality issues be evaluated.

f) The Corps will strive to ensure that the proposed activity is, insofar as possible, consistent with and avoids significant adverse effects on areas which possess recognized historic, cultural, scenic, conservation, recreational, or similar value.

g) If the proposed activity would affect the coastline or baseline of the territorial seas, the Corps must consult with the Attorney General and Solicitor of the Department of Interior.

h) Permit applications will be evaluated as to the potential for proposed actions to adversely affect others, interfere with a riparian owner's access to navigable water of the United States, affect or be affected by a federal water resource project, or be incompatible with federal projects under construction.

i) Applications will be reviewed for consistency and compatibility with approved Coastal Zone Management Plans.

j) If a proposed action affects a marine sanctuary, the Secretary of Commerce must certify that the action can be accomplished within the regulations pertinent to such areas.

k) Processing of Corps permit applications may involve concurrent processing of required other Federal, state, or local approvals. A Corps' permit may be approved prior to final approval of other certifications or required approvals. However, if other Federal, state, or local certifications are denied prior to final action on a Corps' permit application, the Corps' permit will be approved prior to final approval of other certifications or required approvals. However, if other Federal, state, or local certifications are denied prior to final action on a Corps' permit application, the Corps' permit will be denied, but

the applicant has the right to request reinstatement of processing if the other certifications are later approved.

l) Specific land use plans of other Federal, state, local, and Indian tribal agencies must be considered in addition to national interest factors.

m) In the interest of safety, applicants may be required to show that all impoundment structures comply with state dam safety standards or have been designed or reviewed by qualified persons.

n) Whenever practicable alternatives exist outside a flood plain, the District Engineer will avoid, to the extent practicable, authorizing flood plain developments or activities which have long-term or short-term significant adverse impacts upon a flood plain. For those activities in the public interest which must occur in or impact upon flood plains, the District Engineer must assure, to the maximum extent practicable, that the impacts of potential flooding on human health, safety, and welfare and the risks of flood losses are minimized. In such cases, the District Engineer will also strive to restore and preserve the natural and beneficial values served by flood plains.

o) Although the Corps will not impinge upon the states' authority to allocate water, the District Engineer will give full consideration to the public interest review to water conservation and the opportunities to reduce demand and improve efficiency in order to minimize new water supply requirements.

p) Since energy conservation and development is a national objective, the District Engineer will give great weight to energy needs and will give high priority to permit actions involving energy projects.

q) Navigation in all navigable waters is a primary concern of the federal government. The District Engineer will protect navigational and anchorage interests by

recommending denial of a permit unless appropriate conditions are included to avoid any substantial impairment to navigation and anchorage.

r) Section 11 of RHA authorized establishment of harbor lines shoreward of which no individual permits were required. Because harbor lines were established on the basis of navigation impacts only, the Corps of Engineers published a regulation on May 27, 1970 (33 CFR 209.150) which declares that permits thereafter would be required for activities shoreward of the harbor lines. Review of applications is based on full public interest evaluation and harbor lines serve as guidance for assessing navigation impacts.

s) The Corps must authorize any power transmission line crossing a navigable water of the United States unless the lines are part of a water power project subject to the control of the Federal Energy Regulatory Commission. Transmission lines crossing navigable waters are required to have a minimum clearance over the navigable channel provided by existing fixed bridges, or the clearances which would be required by the US Coast Guard for new fixed bridges in the vicinity of the proposed power line crossing. The minimum additional clearance above clearance required for bridges for the low point of the line under conditions which produce the lowest sag is given below for various system voltages as outlined in the National Electrical Safety Code.

Nominal system voltage, kV	Minimum additional clearance above clearance required for bridges, ft
115 and below	20
138	22
161	24
230	26
350	30
500	35
700	42
750 to 765	45

t) All applications for Department of the Army permits should include a complete description of the proposed activity including the following:

(1) Necessary drawings, sketches, or plans sufficient for public notice. (This does not mean detailed engineering plans or specifications.)
(2) The location, purpose, and intended use of the proposed activity.
(3) Scheduling of the activity.
(4) The names and addresses of adjoining property owners.
(5) The location and dimensions of adjacent structures.
(6) A list of authorizations required by other federal, interstate, state, or local agencies for the work, including all approvals received or denials already made.
(7) Information required for public notices.

u) Permit applications should also be prepared in accordance with the following requirements:

(1) All activities related to a single project which require Department of the Army permits should be described within the same application.
(2) If dredging is involved, the application must include a description of the type, composition, and quantity of the material to be dredged, and the method of dredging, and the site and plans for disposal of the dredged material.
(3) If the activity would include the discharge of dredged or fill material in the waters of the United States, the application must also contain a complete description of the activity including the source, type, purpose of discharge, composition, quantity, method of transportation and disposal, and location of disposal site.
(4) If the activity would include a filled area, or pile or float supported platform, the project description must indicate the uses of and specific structures to be erected on the fill or platform.
(5) If an impoundment is included, the application must show that the structure complies with state dam safety criteria or has been designed, reviewed, or modified by qualified persons.
(6) The application must be signed by the person who proposes to undertake the proposed activity or his duly authorized agent. More than one owner or proposer may be represented by a single agent.

v) The District Engineer may request further additional information if essential to assist in the evaluation of the application.

w) Fees are required for permits issued under the Corps' regulatory program.

x) A fee of $100 will be charged for permits for commercial activities and $10 for noncommercial activities. The determination as to the commercial or noncommercial nature of proposed activities will be made by the District Engineer. Fees are not charged for applications withdrawn or denied. Only when an affirmative decision has been reached will the applicant be advised of the appropriate fee.

y) The Corps strives to process applications for individual permits not requiring an Environmental Impact Statement according to the following procedure and time:

(1) Upon receipt of the application, the District Engineer will assign it an identification number and acknowledge receipt of the application. The acknowledgement will advise the applicant of the identification number assigned to its application.
(2) Within 15 days of receipt of the application, the District Engineer must request from the applicant any additional information necessary for further processing.
(3) Within 15 days of receipt of all necessary information, the District Engineer will issue a public notice of the proposed activity and a draft permit.
(4) The public notice period will usually last 30 days but can be extended to 60 days.
(5) The District Engineer must consider all comments received. The applicant will be given a chance to rebut or resolve adverse comments.
(6) Within 60 days of the receipt of the application (90 days, if the public comment period is extended to 60 days), the District Engineer will make a final decision on the application. However, the final decision may be delayed in order to complete other procedural requirements (e.g., the NEPA environmental impact review process, endangered species consultation, or historical/ cultural preservation process).

z) If the proposed activity only needs an individual authorization under Section 10 of the River and Harbor of 1899, (for instance, where the nationwide permit for utility line crossings does not constitute authorization under Section 10 if a navigable water is to be crossed, a letter of permission could be used in such situations in lieu of the complex permit process) the District Engineer can omit publishing a public notice and authorize the activity by a letter of permission if the work meets the following conditions:

(1) The proposed work is minor.
(2) The proposed activity would not have significant individual or cumulative impact on environmental values.
(3) The proposed work would encounter no appreciable opposition.

5.5.7 FAA PERMIT. The Federal Aviation Administration (FAA) must be notified before there is any construction or alteration of more than 200 feet in height above ground level of a site, and any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the following slopes:

a) One hundred to one for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport which has at least one runway more than 3,200 feet in actual length excluding heliports.

b) Fifty to one for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport which has at least one runway more than 3,200 feet in actual length excluding heliports.

c) Twenty-five to one for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport.

5.5.7.1 FORMS. The FAA is notified by filing four copies of FAA Form 7460-1, "Notice of Proposed Construction or Alteration." This notice should be forwarded to the appropriate FAA Regional Office. The notification form must be submitted not later than

30 days prior to the date the proposed construction is to begin. The FAA will acknowledge in writing the receipt of each notice. If the construction or alteration proposed is one for which marking standards are prescribed in the FAA Advisory Circular AC 70/7460-1, the acknowledgment will contain a statement that the structure must be marked and lighted in accordance with the circular. The acknowledgment will also state that an aeronautical study has reached one of the following conclusions concerning the construction or alteration.

a) It would not exceed an obstruction standard and would not be a hazard to air navigation.

b) It would exceed an obstruction standard but would not be a hazard to air navigation.

c) It would exceed an obstruction standard and further aeronautical study is necessary to determine whether it would be a hazard to air navigation. In such cases, the sponsor must request within 30 days that the FAA complete its studies. Pending completion of these studies, it is presumed the construction or alteration would be a hazard. An existing or future structure is considered to be an obstruction to air navigation if it is of greater height than 500 feet above ground level at the site of the object, or greater than certain lesser heights within 6 nautical miles of an airport.

5.5.7.2 SUPPLEMENTAL NOTICE. A supplemental notice filed on FAA Form 117-1, "Notice of Progress of Construction or Alteration," must be filed with the Chief of the Air Traffic Division having jurisdiction over the FAA Region 5 days after the construction reaches its greatest height in the following instances:

a) The construction or alteration is more than 200 feet above the surface level of the site.

b) An FAA regional office advises that submission of the form is required.