Chapter 8 - Regulation and Public Policy

*Questions and Answers*

1. Despite enactment of clean air legislation and regulations, some property owners may wish to sue a source that is alleged to be depositing particulate matter on their property. What would they reasonably expect to gain from filing a civil suit, and what legal principle might they use?

   *They could expect to receive monetary damages associated with loss of the value of their property. They could bring their case based on trespass and/or nuisance principles of common law.*

2. What are air pollution control strategies and how do they differ from tactics?

   A strategy is an overall plan to control air pollution based on one or more principles. The use of air quality management that uses air quality standards is such a principle. A tactic is used to implement the strategy. The use of tall stacks or emission standards to achieve air quality objectives under an air quality management approach are examples of tactics.

3. What air pollution control strategies are used under federal clean air laws? What is their relative significance in air pollution control?

   Both air quality management and emission standard strategies are used. Air quality management is used to control major community air pollutants, e.g., SO₂, PM, etc. Emission standards are used to control emissions from new sources as well as emissions designated as hazardous or “toxic” air pollutants.

4. Describe the theoretical and practical uses of cost-benefit analyses, the bubble concept, and pollution charges in achieving pollution control objectives?

   The premise of cost-benefit analyses is that the level of pollution control that provides the most environmental benefit for costs incurred would be employed. This approach has not been used because of a variety of political constraints. The bubble concept allows a facility to choose how it may achieve a total emission reduction based on a variety of options. Pollution charges would be assessed against a source based on units of emission in the hope that the source would choose to control emissions rather than pay the charge. Such charges have rarely been applied by pollution control authorities.
5. Describe the principle of using allowances to achieve objectives of acidic deposition control.

Under this provision of the CAAA of 1990, sources of SO\(_2\) were given allowances to emit SO\(_2\) to the atmosphere that were phased in in 1995 and 2000. Utilities could choose the most cost-effective way of staying within their allowances. This system resulted in a reduction of 10,000,000 tons of SO\(_2\) annually.

6. What is the primary advantage of controlling air pollution by using air quality standards? Emission standards?

Under air quality standards, emissions need only be reduced to protect public health and/or welfare; this has the potential to be cost effective. Emission standards are simple to implement and administer.

7. What tactics are used to achieve air quality standards?

Tactics include emission standards, fuel use prohibitions, prohibitive bans, use of elevated stacks, process modifications, etc.

8. Describe differences between reasonably available and best available control technologies. When is each used?

Reasonably available control technology (RACT) provides a significant level of pollutant control while taking cost into consideration. It is applied to new sources. Best available control technology (BACT) represents the highest degree of control that has been demonstrated in existing applications. It is more expensive than RACT and is often applied on sources of hazardous pollutants or where a high level of emission reduction is required.

9. Describe a brief history of local, state, and federal efforts in controlling air pollution in the U.S.

Prior to 1960 most air pollution efforts were centered at the local level. In the 1960s, states became more active and had primary air pollution control authority. In 1970 the federal government became the dominant air pollution regulatory authority.

10. What enforcement tools does USEPA have available under the 1970, 1977, and 1990 CAA Amendments?

USEPA can issue administrative orders that require sources to comply with clean air requirements and apply fines and criminal penalties that are enforceable in federal courts. USEPA can request injunctions when there is imminent danger from potentially high air pollution levels.
11. Under the CAA Amendments of 1970, Congress required that air quality standards be set and applied to every Air Quality Control Region (AQCR) in the country. What agency or authority has responsibility for (a) setting air quality standards, (b) enforcing air quality standards?

Air quality standards are promulgated by USEPA. The states are responsible for enforcing them.

12. What is the importance of the following in achieving air quality standards: (1) Air Quality Control Regions (AQCRs), (b) State Implementation Plans (SIPs), (c) emission standards?

Air quality standards are to be met in AQCRs. SIPs describe how each air quality standard is to be met for each AQCR in a state’s jurisdiction. Emissions limits are placed on sources of a regulated pollutant in an AQCR where the standard is not being met.

13. The deadline for achieving air quality standards in all AQCRs in the U.S. was July 1, 1975. It is many years thereafter, and many AQCRs have yet to attain these standards. Why is this the case?

Pollutants such as ozone have been very difficult to control because they are produced secondarily, precursors are transported from one region to another, and the mobile source population, the source of precursor molecules, continues to increase.

14. What options does an industry have if it wishes to build a new facility or expand an existing one in an AQCR where the NAAQS for a pollutant it emits has not been attained?

The source can attempt to offset emissions from their own existing sources or develop agreements with other sources to reduce emissions to provide them with an offset. The source can reduce emissions using the lowest achievable emission rate (LAER) which historically has meant the use of BACT.

15. Both NSPS and NESHAP provisions of clean air legislation employ the “Emission Standard” concept of controlling air pollution. In practice, what differences are there in the application of NSPS and NESHAPs?

(a) NSPSs apply to new and significantly modified sources. NESHAPs apply to all sources of a regulated pollutant.

(b) NSPSs apply to source categories that may pose a health and/or welfare problem. NESHAPs have applied to pollutants believed to pose significant health risks.

(c) Historically, NSPSs are based on reasonably available control technology (RACT) since the 1970 CAA Amendments required that cost of control was to be considered in promulgating NSPSs. NESHAPs are based on best available control technology (BACT) and legally need not significantly consider control costs.
(d) The “air toxics” provision of the 1990 CAA Amendments supercedes previous NESHAP provisions. It requires the use of maximum achievable control technology (MACT) and consideration of the cost of control for pollutants not previously regulated. Those seven previous regulated are subject to original NESHAP requirements.

16. Prior to the 1990 CAA Amendments, seven pollutants were regulated as hazardous pollutants. Under the Air Toxics provision of the 1990 CAA Amendments, an additional 182 substances were to be regulated under this concept. These additional substances are regulated using technology-based MACT standards. Describe what MACT standards are.

MACT standards are designed to achieve a significant level of control of “air toxics” by application of a variety of control practices including in-plant and “end-of-the-pipe” control measures.

17. What are the responsibilities of federal and state agencies relative to air quality standards, NSPS, NESHAP, and regulation of motor vehicle emissions?

The federal government promulgates air quality standards, NSPSs, NESHAPs, and motor vehicle emission standards. It is solely responsible for enforcing motor vehicle provisions of clean air legislation. It requires states to develop and enforce implementation plans for air quality standards. States may also be delegated authority to enforce NSPSs and NESHAPs.

18. Describe the purpose and statutory requirements of PSD.

PSD is designed to protect areas of high air quality. Statutory authority is provided under the 1977 CAA Amendments.

19. Describe regulatory authorities and actions used by USEPA to protect the environment from O₃-destroying chemicals.

USEPA was given statutory authority to regulate O₃-destroying chemicals under the 1977 CAA Amendments. This authority was expanded under the 1990 CAA Amendments. As a result of these authorities, USEPA banned non-essential uses of CFCs in 1978 and achieved their complete phase-out by 2000 in accordance with the Montreal Protocol.

20. In the 1990 CAA Amendments, Congress required that a uniform permit system be developed. Describe the use and significance of permits in achieving air quality objectives.

Permits are used by control authorities to administer emission reduction requirements on sources. Sources can only operate and emit regulated pollutants if they have a permit to do so. Permits place the burden of proof on sources that they are complying with emission reduction requirements.
21. Since 1990, a 10-million ton/yr reduction in SO\textsubscript{x} emissions has been achieved in the U.S. Describe how this was accomplished.

This was achieved in two stages using an allowance system. Under this system, utilities were given allowances for each ton of SO\textsubscript{2} emitted. The first stage went into effect in 1995 and the second in 2000. The allowance provided sources the opportunity to choose the most cost-effective approaches to achieve SO\textsubscript{2} reductions in accordance with allowance allotments.

22. Briefly describe the statutory history of air pollution control requirements on light-duty motor vehicles.

Motor vehicle emissions were first regulated in California where, in 1961, new motor vehicles were required to control crankcase emissions. Similar requirements were required nationwide in 1963. Exhaust gas emission standards for CO and hydrocarbons were applied to new cars sold in CA in 1966 and applied to all new cars sold nationwide in 1968. Both CA and U.S. governments tightened exhaust gas emission reduction requirements in 1970. In 1970 and 1971, CA and the U.S., respectively, required control of evaporative emissions. In 1970, Congress mandated tough new exhaust gas emission reduction requirements to be achieved on 1975 model light-duty motor vehicles. In the early 1970s, both CA and the U.S. government began to regulate NO\textsubscript{x} emissions. In 1975, deadlines for achieving emission limits required in the 1970 CAA Amendments were postponed until 1977. In the meantime, USEPA imposed interim standards. In 1977, Congress postponed the implementation of the 1970 exhaust emission reduction requirements. The 1990 CAA Amendments required that emission reduction requirements under the 1970 CAA Amendments were to be achieved by 1995, with additional reduction in hydrocarbons.

23. USEPA has authority to control fuel additives. Why and how has it used this authority to reduce the lead content of gasoline?

This authority was first used to phase out the use of lead additives so that catalytic systems could be used. Lead coats catalytic surfaces and renders them inactive.

24. In addition to requiring emission reductions from motor vehicles, Congress has required petroleum refiners to produce gasolines that result in emissions reductions. Explain these requirements and their significance.

Under the 1990 CAA Amendments, refiners were required to produce reformulated gasoline for use in areas subject to elevated O\textsubscript{3} and/or CO levels. These requirements result in lower emissions of CO, reactive hydrocarbons, and “air toxics” such as benzene.
25. Despite the fact that most new cars and trucks have emissions that are a small fraction of those of motor vehicles built 35 years or more ago, motor vehicle air pollution is still a major problem. Why?

In the past 35 years the number of vehicle miles traveled per year in the U.S. has quadrupled.

26. Describe how state boards and agencies function in implementing the requirements of federal legislation.

State boards write rules and regulations and adjudicate violations of such rules. State agencies conduct day-to-day activities including inspections, permits administration, compliance determinations, and enforcement recommendations.

27. What is the Kyoto Protocol? Why is it so controversial in the U.S.?

The Kyoto Protocol is an international treaty to which signatories have agreed to reduce greenhouse gas emissions to target levels. Because of potential economic impacts, the U.S. refused to ratify the Protocol.

28. How could provisions of the Kyoto Protocol as they would have applied to the U.S. be achieved without significant economic impact?

The easiest way would be to significantly increase fuel economy on all new motor vehicles. The technology is available to do so without a significant economy-wide impact.

29. New air quality standards for PM$_{2.5}$ and O$_3$ were promulgated in 1997 but were not immediately implemented. Why was this the case?

They were contested in the federal courts by industry and industry-supporting groups. These legal challenges delayed implementation until 2004.

30. What is new source review (NSR) and how does it apply to coal-fired power plants?

When a new coal-fired power plant is to be constructed, it must undergo USEPA/state reviews for compliance with NAAQS and PDS requirements. These requirements also apply to significantly modified existing sources. In some cases, existing plants made significant changes in their facilities that they indicated were not subject to NSR because they were "routine maintenance"-type changes. These changes were disputed by USEPA which claimed that, in many cases, changes were made that went beyond "routine maintenance".