create more business for facilities. Finally, some facilities perform a service for the rest of their company, such as generating a metal-rich sludge which may be incorporated into the parent companies smelting processes.

For these reasons and because of the captive nature of many facilities, company-level impacts are a more appropriate indicator of economic achievability, as they measure the decision making process of companies and the resources available to achieve compliance. Facility-level changes in revenues where applicable and costs are computed as inputs to the company level analysis.

3. Economic Impact Methodology

Standard economic and financial analysis methods are used to assess the economic effects of the proposed regulation. These methods incorporate an integrated view of Centralized Waste Treatment facilities, the companies that own these facilities, the markets the facilities serve, and the communities where they are located.

Faced with increased costs of the proposed regulation, owners of CWT facilities have three choices: (1) Comply with the guidelines and incur the costs, (2) if a facility has operations in more than one subcategory, close the most affected operation, or (3) close the facility. Conventional economic reasoning argues that companies will make their decision based on an assessment of the benefits and costs of the facility to the company.

For commercial CWT facilities, the cost and benefits are readily observable—benefits to the company are the total revenues received; costs to the company include the payments made to the factors of production (labor, materials, etc.) plus the opportunity costs of self-owned resources (e.g., the land and capital equipment). As previously discussed, the cost associated with closure of a RCRA facility have caused facilities to remain open even when experiencing economic and financial difficulties.

For captive facilities, there is no quantifiable measure of benefits to the company of having the capacity to manage the wastes in a facility owned by the company because there is no easily defined relationship between the wastes and the products that generate the wastes. Clearly, however, companies do weigh the benefits and costs of operating a CWT facility, and the benefits in this case may include lower expected future liability costs, more control over the costs and scheduling of treatment, and certainty that treatment capacity exists for their wastes.

According to conversations with captive facilities, most are in business solely for the purpose of lower liability costs associated with the selfmanagement of hazardous wastes.

Changes in the costs of treatment in CWT facilities may be expected to result in an increase in the price of services, which will feed back to the revenue side of commercial facilities. Overall, as long as generators have alternatives to commercial treatment (e.g., on site treatment, pollution prevention) the quantity of services traded may be expected to fall as a result of the guidelines and standards. But for some services, such as cyanide treatment or treatment of concentrated metals sludges, there are no other alternatives to commercial treatment.

Changes in the economic conditions in the CWT industry may impact the viability of the companies that own CWTs. Specifically, some companies that are already marginal or that operate a single unprofitable facility may go out of business either by simply liquidating their assets, or by declaring bankruptcy.

Finally, the communities where the CWT facilities are located may be impacted. Obviously, if facilities cut back operations, employment and income may fall sending ripple effects throughout the local community. On the other hand, there may be increased employment associated with operating the pollution controls associated with the regulation resulting in increased community employment and income. At the same time, for the communities in which CWTs are located, water quality may be expected to improve.

4. Application of the Market Analysis

For the market analysis, EPA characterized each facility individually based on the quantity of each type of waste treatment service they provide, their revenues and costs, employment, market share for each type of service provided, ownership, releases, and location in terms of the community where they are located and the regional market they serve. Six regional markets are defined.

Costs of CWT facilities include both those that vary with the quantity of CWT services provided (variable costs) and those whose value is fixed. Pergallon variable costs are assumed constant to the capacity output rate. Revenues from CWT operations are estimated by multiplying the market price of the CWT service by the quantity of waste treated in the CWT service. Most CWT facilities also have revenues from other sources, which are treated as exogenous.

The demand for CWT services is characterized based on the responsiveness of quantity demanded to price. CWT services are intermediate goods demanded because they are inputs to production of other goods and services. The sensitivity of quantity demanded to price for an intermediate good depends on the demand characteristics (elasticity) of the good or service it is used to produce, the share of manufacturing costs represented by CWT costs, and the availability of substitutes for CWT services. The elasticity of demand for manufactured products varies widely. CWT services costs as a share of manufacturing costs is generally quite small. Substitutes for CWT services include other types of offsite waste management such as underground injection, on-site treatment, or pollution prevention. Overall, the change in quantity demanded for CWT services is assumed to be approximately proportional to any price change (e.g., a one percent increase in the price of a CWT service is expected to reduce the quantity demanded for the service by about one percent).

The markets for CWT services are regional. This market characterization is based on responses to the questionnaire and is consistent with the theory of economic geography. Within each market, there are a relatively small number of suppliers and a relatively large number of demanders. Thus the market structure is treated as being imperfectly competitive. This implies that the competition each facility faces is limited to facilities in its region so that all suppliers have a degree of market power.

This characterization of facilities, companies and markets is incorporated in a model that takes the engineering estimates of the costs of compliance with the effluent limitations guidelines and standards and projects impacts on facilities, companies, markets and communities. Each CWT faced with higher costs of providing CWT services may find it economical to reduce the quantity of waste it treats. This decision is simultaneously modeled for all facilities within a regional market, to develop consistent estimates of the facility and market impacts. Changes in the quantity of CWT services offered result in changes in the inputs used to produce these services (most importantly, labor).

For commercial facilities, the EIA thus projects changes in employment at CWT facilities. Changes in facility revenues and costs result in changes in the revenues and costs of the companies owning the facilities, and thus changes