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Are Your Port's **EMISSIONS** **TIME**

By Robert P. Newman, P.E., BCEE
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Under Control **2014**

The United States is served by some 360 coastal and inland commercial ports that, as a whole, represent a significant part of the country's economy. Each year, U.S. ports are responsible for handle about 2 billion tons of cargo (import, export, and domestic). Shipping is projected to substantially increase in the next decade.

Since ports in the U.S. are such major hubs of economic activity, they also can be major sources of pollution. Enormous ships with engines running on a variety of fuels, thousands of diesel truck visits per day, mile-long diesel locomotives hauling cargo, and other activities at marine ports cause an array of environmental impacts that can potentially affect local com-

munities and the environment.

One of the most significant of the environmental impacts is air pollution. This impact is amplified by the fact the most of the major ports are in regions of the county currently classified as in non-attainment with the USEPA Clean Air Act (CAA).

To compound air quality issues, most major ports in the U.S. are undergoing expansions to accommodate even greater cargo volumes. The growth of international trade has resulted in the rapid growth in the amount of goods being shipped by sea.

Other factors, such as the eventual widening of the Panama Canal, will allow for more, and much larger, vessels carrying increased cargo tonnage

to frequent US ports.

For decades, the size of the Panama Canal has been a constraint on the maritime industry, which has been building ships that significantly exceed the canal's navigable dimensions, limiting direct international trade options, most especially for East and Gulf Coast ports of the U.S.

These factors will affect coastal ports, but will also have a direct and immediate impact to America's inland port facilities.

Managing air quality issues at America's inland ports fall within two categories.

EMISSIONS FROM PORT IMPROVEMENTS

The first is to address emissions associated with port improvements,

such as dredging and land-side construction activities. Such activities can actually require regulatory approval under the provisions of the Clean Air Act, specifically a statute known as General Conformity.

The General Conformity Rule establishes conformity in coordination with, and as part of, the National Environmental Policy Act (NEPA) process. It applies to regions that are in non-attainment with USEPA air quality standards. The rule takes into account air pollutant emissions associated with actions that are federally funded, licensed, permitted, or approved, and ensures emissions do not contribute to air quality degradation, thus preventing the achievement of state and federal air quality goals.

Succinctly, General Conformity re-

fers to the process of evaluating plans, programs, and projects to determine and demonstrate that they meet the



requirements of the CAA and applicable State Implementation Plan (SIP).

Conformity determination is a two-step process: (1) applicability analysis, and (2) conformity analysis.

Applicability analysis is achieved by comparing the project's annual

emissions to "de minimis" pollutant thresholds outlined in the conformity rule. The more severe the "non-attainment" status of a region, the smaller the corresponding de minimis threshold is set. Projects that are over the thresholds are required to offset emissions by mitigation or the use of emission reduction credits (ERCs).

There are exemptions to the General Conformity applicability that are favorable to inland ports. For example, dredging that is considered "maintenance" is not regulated by the process.

OPERATIONAL EMISSIONS

The second category of emissions ports need to be concerned with are operational emissions, both landside and waterside.

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This is typically done by the use of an Emission Inventory (EI). An EI will allow a port to better understand the emissions from typical port activities; will help the port, its tenants and the community to prioritize emissions reduction efforts; and will provide a baseline for tracking progress in reducing air pollution.

Air pollution emission inventories can also become the basis for trends analysis, regional and local scale air quality modeling, greenhouse gas studies, regulatory impact assessments, and human exposure modeling.

Understanding operational emissions will also help in determining compliance with local air quality regulations and permits.

There are many regulatory drivers that will continue to restrict air pollutant emissions from port operations. Many States have adopted requirements in their SIP that restrict operations of ships and vehicle fleets (e.g., idling times).

The EPA has also adopted the International Maritime Organization (IMO) requirements that provide timelines for aggressive emission reductions of a variety of pollutants including SO_x, NO_x, and particulate matter.

IMO has also adopted mandatory technical and operational energy efficiency measures which will significantly reduce the amount of CO₂ emissions from international shipping.

The IMO has recently introduced Emission Control Areas (ECAs) to reduce emissions of air pollutants further in designated sea areas around globe, including the U.S.

IDENTIFY YOUR PORT'S EMISSIONS

To characterize emissions from port operations there are a wide range of analytical methodologies. The procedures can be quite varied and complex due to the diverse nature of emission sources at ports.

The main emissions sources include ocean-going vessels, harbor craft, cargo handling equipment, rail operations, and heavy duty trucking.

Each of these categories will have

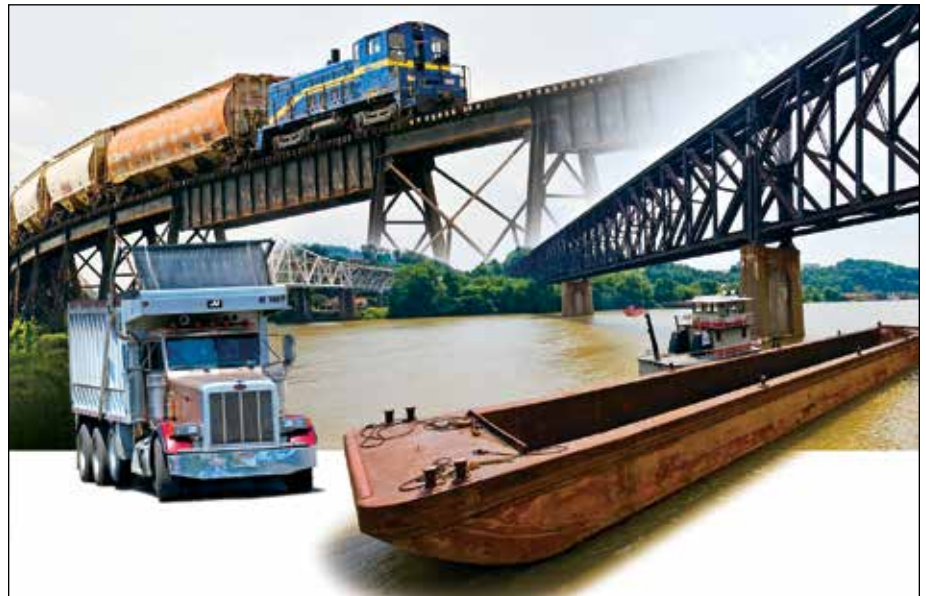
numerous types of sources and parameters, each with unique emission signatures. For example, for marine vessels the determination of the emission factor to be used (g/HP-hr), horsepower of engine, and load factor would be of prime importance in calculating emissions.

Addressing air quality challenges at U.S. inland ports is manageable, but does take a well-planned and focused approach.

The protection of air resources, while at the same time ensuring economic viability and competitiveness, is the key.

An important part of any strategy is to build partnerships among port stakeholders to promote ongoing efforts to reduce emissions from port operations. Such stakeholders include community groups, local governments, terminal operators, shipping carriers, and other business entities. ^{1P}

Robert P. Newman, P.E., BCEE, is a Principal at Zephyr Environmental Corporation in Columbia, MD.



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