

1.0 INTRODUCTION

The purpose of the Water Quality Environmental Assessment (WQEA) is to estimate the change in water quality conditions resulting from implementing an effluent guideline and pretreatment standards for a given industry.

This WQEA presents the results of the water quality assessment performed by the U.S. Environmental Protection Agency (EPA) as part of its effort to develop effluent limitations guidelines and pretreatment standards for Meat and Poultry Processing Industry (MPP) facilities.

1.1 DEFINITION OF MPP

EPA defines the meat and poultry products (MPP) industry as facilities that slaughter livestock (e.g., cattle, calves, hogs, sheep, and lambs), and/or poultry or process meat, and/or poultry into products for further processing or sale to consumers. The industry is often divided into three categories: (1) meat slaughtering and processing; (2) poultry slaughtering and processing; and (3) rendering.

1.2 WATER QUALITY ISSUES RELATED TO MPP

The meat poultry processing industry (excluding rendering) uses an estimated 150 billion gallons of water per year and ranks in the top third of all three digit SIC manufacturing sectors with regard to overall water consumption. Water is used to clean the product, clean and sanitize the production equipment, and to transport the waste away from the production area. Water can also be used as a part of the process, such as in scalding birds to facilitate feather removal or chilling the animal or meat to reduce its temperature. Although a portion of the water used by this industry is reused and or recycled, most of the water becomes wastewater that is ultimately discharged into the nation's waterways, either directly by the facility or indirectly through a

Publically Owned Treatment Works (POTW).

1.3 POTENTIAL ENVIRONMENTAL IMPACTS OF MPP

The untreated wastewater of MPP facilities contains high concentrations of biodegradable dissolved organics, biochemical oxygen demand (BOD), total suspended solids (TSS), oil and grease, pathogens, and nutrients nitrogen (including ammonia) and phosphorus. EPA's sampling data collected from MPP facilities also found treatable concentrations of some metals (e.g., copper and zinc). Some of these metals are fed to the animals as feed additives, and therefore are assumed to be the source for these pollutants in the wastewater.

The discharge of high levels of biodegradable organics into receiving streams results in increased microbial activity, as the microorganisms biodegrade these materials. This increase in microbial activity requires greater amounts of oxygen than natural aeration processes can provide. This deficit results in the decrease of available dissolved oxygen (DO) for more complex aquatic organisms. This potential of a pollutant to remove oxygen from receiving waters is called the biochemical oxygen demand (BOD). High concentrations of BOD can reduce the DO content of waterbodies to levels insufficient to support fish and invertebrates.

Habitat degradation can result from increased suspended particulate matter. Suspended particulate matter reduces light penetration, and thus primary productivity. Accumulation of suspended particles may also alter benthic spawning grounds and feeding habitats.

Nutrients, including phosphorus and nitrogen, are the primary causes of surface water eutrophication, which can reduce dissolved oxygen content of waterbodies to levels insufficient to support fish and invertebrates. Eutrophication may also increase the incidence of harmful algal blooms that release toxins as they die and can severely affect wildlife, as well as humans. Additionally, meat and poultry processing raw wastewaters contain significant amounts of

organic nitrogen which rapidly breaks down into ammonia. If left untreated, this poses a direct toxicant to aquatic communities.

Oil and grease are known to produce toxic effects on aquatic organisms (i.e., fish, crustacea, larvae and eggs, gastropods, bivalves, invertebrates, and flora). Pathogens are known to impact a variety of water uses including recreation, drinking water sources, and aquatic life and fisheries (Docket No. W-01-06, Record No. 10024 - Pathogen TMDL report).

1.4 ORGANIZATION OF REPORT

EPA has organized this WQEA report into five sections. Section 2 outlines the methodology EPA used to evaluate water quality effects from direct and indirect discharging facilities. Section 3 describes the data sources used for evaluating water quality effects, such as facility-specific data, water use category criteria, and documented environmental impact data. Section 4 presents a summary of the results of this analysis. Section 5 provides a complete list of references cited. Appendices B and C provide additional detail on the specific information addressed in the main report.

