ENV 5011 Discussion 5.2: *Cost-Benefit Analysis*

Prompt: Critique AND defend the use of cost benefit analysis (CBA) under the statute you considered in Unit 4. Without doing the actual math, outline the elements of an appropriate CBA specific regulated substance in your area, then identify the strengths and weaknesses of your own CBA.

The objective of the Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S. Code §1251(a), and it attempts to do so through the use of technology-based effluent limitations (TBELs) that are promulgated under national pollutant discharge elimination system (NPDES) permits, which are required for all individual point source dischargers of pollutants (Plater, et al., 2010). The promulgation of these effluent limitations for point source polluters begins by establishing the existence of a hazard, the quantities of the hazard that pose a health risk, what the problems are at different exposures, and what is the extra risk associated to those exposed (Plater et al., 2010). This process of risk assessment then leads to risk management by the involved agency.

Cost-benefit analysis (CBA), when applied towards the process of managing the risks of pollutant discharge into navigable waters, is an imperfect approach. Theoretically, the process of examining multiple management strategies from a variety of sources to achieve regulatory goals will help agencies engage in productive rulemaking and the resulting framework aids the decision maker in comparing alternative technologies to arrive at the "least burdensome option."

The EPA requires varying levels of technological control under NPDES permitting that are heavily focused on balancing the costs of applying technology with those costs incurred as a result of mitigating the negative effects determined by the risk assessment. Controls for effluent limitations of priority, conventional, and nonconventional pollutants in the form of best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and best available technology economically achievable (BAT) all set cost as a priority determinant. While the calculations involved can certainly become complex, the quantitative market valuations for technology are more readily available and concrete than the estimated costs associated with environmental services. The requirement to artificially monetize health and environmental impacts from pollution discharge in order to achieve this decision-making framework creates a subjective valuation that does not accurately take into account the intrinsic value of nature, and further jeopardizes the future capabilities of environmental services through market discounting (Plater et al., 2010).

Eutrophication in Maui waters along the western shoreline results, in part, from nutrient loaded effluent plumes that have originated from the Lahaina Wastewater Reclamation Facility (LWRF) (Glen et al., 2013). Regional wastewater arriving at the LWRF

undergoes varying levels of treatment, depending on its intended reuse or disposal. In the case of "R2" water, the effluent undergoes secondary treatment, and chlorine disinfection and the excess nitrogen and phosphorous laden effluent is then gravity injected into wells that are hydrologically connected to coastal waters via groundwater seeps. Dailer et al. (2012) suggested that this nutrient-laden water is responsible for excessive algal biomass production that overgrows and destroys the nearshore coral reefs and has cost the County of Maui over 20 million dollars annually in economic losses.

The County's permits require that injected effluent is secondarily treated to the standards set forth in 40 CFR §133.102 and 42 USC Subchapter XII that require water consisting of no more than than 30 mg/l of Biochemical Oxygen Demand (BOD5), 30 mg/l Total Suspended Solids (TSS) and 10mg/l of Total Nitrogen. Any further reduction of total nitrogen or phosphorus, (through nutrient rulemakings), would incur additional costs through the augmentation of publicly owned treatment works (POTWs). Although the reduction of nutrient pollution is claimed to be a "top priority" of the EPA, it has determined that the establishment of nutrient discharges in the secondary treatment standard under the CWA are "not warranted at this time" and additional analysis is necessary (Shapiro, 2012).

The EPA's position reflects a faulty and contradictory CBA. While they state that nutrient removal technologies "can and should be installed, even though it may be costly," the obstacles to developing a uniform technology-based solution nationwide are too prohibitive (Shapiro, 2012). The EPA's CBA in this instance only accounts for the financial burden of POTWs and does not take into account the ecological and tourism economics.

References

Dailer, M., Smith, J., Smith, C. (2012). Responses of bloom forming and non-bloom forming macroalgae to nutrient enrichment in Hawai'i, USA. (2012). *Harmful Algae*, *17*, 111–125. https://doi.org/10.1016/j.hal.2012.03.008

Glenn, C., Whittier, R., Dailer, M., Dulaiova, H., El-Kadi, A., Fackrell, J., Kelly, J., Waters, C., Sevadjian, J. (June 2013). *Lahaina Groundwater Tracer Study.* Department of Geology and Geophysics. Prepared for State of Hawaii Department of Health, US Environmental Protection Agency, and US Army Engineer Research and Development Center. University of Hawaii: Honolulu, Hawaii. Retrieved at https://earthjustice.org/sites/default/files/Lahaina-Tracer-Dye-Study.pdf

Plater, Z., Abrams, R., Graham, R., Heinzerling, L., Wirth, D., & Hall, N. (2010). Environmental law and policy: nature, law, and society (4th ed). New York: Aspen Publishers.

Shapiro, M., (2012). Official correspondence to Alexander, A. of the National Resources Defense Council. US Environmental Protection Agency. Washington, DC. Retrieved from https://www.epa.gov/sites/production/files/2015-11/documents/ow_shapiro_nrdcpetition.pdf