

*distillation plus advanced biological treatment plus end-of-pipe Granular Activated Carbon (GAC) adsorption technology.*

This option adds Granular Activated Carbon adsorption treatment to the technology described in Option 3 for the purpose of achieving additional removal of the pollutant parameter COD beyond that achieved by Option 3.

EPA selected Option 2 as the proposed technology basis for BAT limitations for facilities with subcategory A and/or C operations because EPA believes this option represents the best available technology economically achievable, considering all statutory factors.

The Agency found that the annual incremental increase in electrical power consumption for all facilities to achieve Option 2 was 13,200 MW. This increase is equivalent to an increase of approximately 0.25 percent of the pharmaceutical industry's purchased electrical energy usage in 1990. Using the industry's 1990 purchased electrical energy usage as a baseline, the estimated incremental increases for electrical power consumption for the remaining options were, for Option 3, an increase of 13,800 MW and, for Option 4, an increase of 17,900 MW. With respect to energy needs associated with steam generation for steam stripping and distillation, the Agency found that Option 2 would result in 720,000 MW of incremental energy consumption, or approximately an 8 percent increase above the industry's 1990 total energy consumption. For Option 3, EPA found that 2,220,000 MW of incremental energy consumption, or a 25 percent increase above the industry's 1990 total energy consumption, would be required. EPA did not select Option 3 as proposed BAT because of this large increase in energy consumption required for steam generation. This decision is consistent with the CWA's requirement that EPA take into account energy requirements in selecting BAT. While steam generation under Option 2 requires slightly higher energy consumption than the 1990 baseline, the Agency notes that the potential for solvent recovery and reuse will substantially offset these energy expenditures. See Section XII.B of this preamble for further discussion of "clean fuels." Further discussion of these non-water quality environmental and energy impacts also is presented in Sections 12 and 15 of the TDD.

EPA also is proposing standards to control COD, based upon advanced biological treatment. These proposed BAT limitations are based on the performance of the "best" performers among facilities with subcategory A

and/or C operations. EPA believes that a substantial portion of the raw waste load COD can be removed in plant, prior to advanced biological treatment, by application of steam stripping technology—upon which the proposed BAT limitations for priority pollutants and the other nonconventional pollutants are based. However, EPA lacks sufficient data at this time to quantify the removal of COD achievable through in-plant steam stripping, and in turn the further removal of remaining COD load achievable by advanced biological treatment, and therefore does not propose its subcategory A and/or C BAT limitations for COD based on that combination of technologies. EPA solicits data and comments concerning the establishment of EPA for COD for subcategories A and C based on steam stripping plus advanced biological treatment. See Section XIV, solicitation number 20.

In estimating the energy consumption for steam generation associated with Option 3, EPA assumed, based on available data, that very high volumes of wastewater would need to be stripped and distilled, thus requiring high demands for steam. EPA believes that this assumption is very conservative because the Agency assumed from the 308 questionnaire responses that wastewater streams containing high concentrations of volatile organic pollutants could not be segregated from streams containing minimal or no concentrations of these pollutants. EPA believes that stream segregation is possible. EPA further expects that more recent data will show that the volume of wastewater that would be subject to steam stripping and distillation is substantially lower than the volume assumed in this proposal. Such lower volumes would also invariably result in higher concentrations of the volatile organic pollutants to be stripped. Considerably less steam, and hence considerably less energy, would be necessary to strip (Option 2) or distill (Option 3) such pollutants from low volume, high concentration wastewater. If more recent data fulfills this expectation, the Agency may reconsider Option 3 for A and/or C subcategory facilities. Therefore, EPA invites comments and data regarding the volume of wastewater that may require steam stripping and the pollutant concentrations in those wastestreams. See Section XIV, solicitation numbers 6.0 and 15.6. EPA also solicits comments on the use of distillation technology for the purpose of obtaining additional removal of pollutants such as methanol that are difficult to steam

strip. See Section XIV, solicitation number 15.9.

The Agency considered other non-water quality environmental impacts of the selected option, including the role which this proposal may play in the minimization, recycle, and disposal of characteristic (ignitable) volatile organic wastes. EPA has determined that Options 2 and 3 will generate 52,200 and 61,000 metric tons per year of condensates, respectively (more than Option 1 because of the use of steam stripping and steam stripping with distillation technologies). The condensates may include both halogenated and nonhalogenated solvents. Plants may choose to purify these condensates and then recycle/reuse the purified solvents as raw materials or use the condensate streams as fuel for incinerators either on or off site. If plants choose the latter approach, EPA has determined that adequate commercial incinerator capacity exists. Although EPA believes that most facilities will either recycle or incinerate their steam stripping condensates on-site because, in many cases, adequate recycle or incineration capability exists on-site, the Agency has adopted the conservative approach in its BAT cost estimates by assuming all condensates will be disposed of by off-site incineration. Because Option 3 features distillation in addition to steam stripping and achieves greater organic pollutant removal, resulting in a higher volume of condensates, EPA determined that the estimated costs of off-site incineration of the resulting condensates would be about 10 percent higher for Option 3 than for Option 2. Because the cost differential between Options 2 and 3 represents only a small part of the total costs associated with Option 3, EPA did not regard it as a significant factor. Accordingly, EPA concluded that the generation of condensates as a result of steam stripping and steam stripping with distillation technology does not provide a basis for choosing between technology Options 2 and 3 as the basis for BAT limitations for facilities with subcategory A and/or C operations. A more complete discussion of the Agency's waste minimization and combustion strategy and its relationship to this industry and rulemaking is presented in Section XII.B of this preamble and in Section 7 of the TDD.

The Agency also considered the effect of Options 1, 2, 3, and 4 on the current levels of air emissions from wastewaters at facilities with subcategory A and/or C operations. EPA used the WATER7 computer model employed by the EPA Office of Air and Radiation (OAR) in the