

be required to close their wells and adopt different wastewater disposal practices, which could consist of surface water disposal, ocean outfall, and/or reuse. Use of these alternative disposal practices would likely require the construction of facilities with advanced wastewater treatment, nutrient removal, and high-level disinfection.

EPA proposed two primary options for the additional requirements: Option 1—Facilities must provide advanced wastewater treatment and high-level disinfection with a demonstration that the injectate will not cause a USDW to exceed any national primary drinking water regulations in 40 CFR part 141 and other health-based standards (e.g., Federal or State health advisories approved by the UIC Program Director, if a national primary drinking water regulation is not available for specific pollutants); and Option 2—Facilities must conduct an in-depth hydrogeologic demonstration that the injection operation would not cause fluids that will migrate into the USDW to exceed any national primary drinking water regulations in 40 CFR part 141 and other health-based standards and, if the demonstration is not successful, must provide advanced treatment, as necessary, to ensure that injectate will not cause a USDW to exceed any national primary drinking water regulations in 40 CFR part 141 and other health-based standards. This second option also proposed a provision whereby all facilities qualifying for authorization to inject under this option would be required to install advanced wastewater treatment and high-level disinfection by 2015. The preamble to the proposal describes in detail the history of domestic wastewater injection in Florida, along with the features of Florida geology that have allowed some of that injected wastewater to enter USDWs. EPA received approximately 1,200 comments on the proposal (the comment period closed on October 22, 2000). The Agency will address these comments, along with comments received in response to this notice of data availability, as part of the final action on this rulemaking.

C. Relative Risk Assessment of Management Options for Treated Municipal Wastewater in South Florida

As part of EPA's fiscal year 2000 appropriations bill, Congress included the following provision: "Within available funds, the conferees direct EPA to conduct a relative risk assessment of deep well injection, ocean disposal, surface discharge, and aquifer recharge of treated effluent in South Florida, in close cooperation with the

Florida Department of Environmental Protection and South Florida municipal water utilities." Because this directive came at a time when EPA's work on the July 7, 2000, proposal was substantially complete, the Agency decided to proceed with the proposal and the relative risk assessment along separate but converging paths. First, EPA published and sought comment on the proposal based on information available at that time. Second, EPA initiated and conducted the relative risk assessment with the intent of using relevant findings to inform the final rulemaking.

EPA started the relative risk assessment by working with stakeholders to develop an appropriate methodology. The Agency first outlined a proposed methodology following standard risk assessment principles and guidance, such as the "Guide for Developing Conceptual Models for Ecological Risk Assessments."¹ EPA then held a stakeholders meeting on March 20, 2001, in Tallahassee, Florida to discuss the proposed methodology. The meeting was attended by 17 stakeholders representing municipal water utilities, regulators, and community and environmental groups. Participants offered comments on the proposed methodology, which EPA adopted accordingly.

The methodology involved a process for investigating the four very different wastewater disposal options: deep well injection, aquifer recharge, discharge to ocean outfalls, and discharge to other (non-ocean) surface water bodies. Each option has its own specific stressors (hazards), exposure pathways, receptors, and effects. Parameters that are relevant to one particular disposal option are not necessarily relevant to the remaining three. Therefore, a strictly quantitative comparison between the four options was not possible.

Instead, EPA conducted what is termed a relative risk assessment to both assess the risks and allow comparisons. Individual risk assessments were completed for each wastewater disposal option and the risks associated with each were characterized. The risks and risk factors identified through each option-specific disposal option were then evaluated and described. The overall comparisons and conclusions were then presented as relative risk assessment matrices.

The steps involved in the relative risk assessment included developing a Generic Risk Analysis Framework

followed by conducting analyses of option-specific conceptual models. Data from many sources were used to support the analyses. These sources include the Florida Department of Environmental Protection, utilities (and the South Florida Water Environment Utility Council), and municipalities in South Florida. EPA also worked with a panel of experts both inside and outside of EPA and from a variety of fields to review and incorporate data and information acquired through exhaustive searches of the relevant scientific research literature. Risk characterization for each option included identifying and describing the associated risks, their potential magnitude, and the potential effects on human and ecological health. The relative risk assessment then described and compared risks for all four wastewater management options. Finally, the relative risk assessment was peer reviewed in accordance with the Agency's Peer Review Handbook.

III. Findings of the Relative Risk Assessment Pertaining to Deep Well Injection

The relative risk assessment offers comparisons of deep well injection, ocean disposal, surface discharge, and aquifer recharge of treated municipal wastewater in South Florida. Findings related to each of these management options are highlighted in a separate notice in today's **Federal Register** and presented in greater detail in the relative risk assessment report. EPA is seeking comment in sections IV and V below on how these findings should inform the final rulemaking on Class I municipal wells in Florida. To provide background and context for those following sections, the remainder of this section summarizes how the relative risk assessment addresses five key questions specifically related to deep well injection.

A. What Level of Treatment and Disinfection Is Provided for Deep Well Injection?

All facilities that manage municipal wastewater by deep well injection in Florida are required to provide, at a minimum, secondary treatment of the wastewater prior to injection. Secondary treatment comprises biological removal of dissolved organic and inorganic matter, commonly through such methods as activated sludge and trickling filter processes. By itself, secondary treatment does not remove microorganisms by either disinfection (through the addition of chlorine, for example) or filtration.

¹ Prepared by G.W. Suter II of Oak Ridge National Laboratory for the U.S. Department of Energy. Report No. ES/ER/TM-186 issued in May 1996. Available at <http://www.esd.ornl.gov/programs/ecorisk/tm186.pdf>.