BENEFICIAL USE OF WASTE TIRE MATERIAL

GUIDANCE FOR USING TIRE CHIPS AS LEACHATE DRAINAGE MATERIAL AT MUNICIPAL SOLID WASTE LANDFILLS

JULY 2002

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

SOLID WASTE MANAGEMENT BRANCH

GUIDANCE FOR USING TIRE CHIPS AS LEACHATE DRAINAGE MATERIAL AT MUNICIPAL SOLID WASTE LANDFILLS

Mississippi Department of Environmental Quality

Solid Waste Management Branch

July 2002

The purpose of this document is to provide Municipal Solid Waste Landfill owners/operators with guidance in the use of tire chips in the design and construction of leachate collection systems at municipal solid waste landfills. Together, the Federal Subtitle D Regulations and the Mississippi Nonhazardous Waste Management Regulations require that the leachate collection systems of solid waste municipal landfills be designed and operated such that less than a 30-cm depth of leachate is maintained over the flexible membrane liner (FML). The Department recognizes that there are many potential benefits to the use of tire chips in leachate collection systems at municipal solid waste landfills. Those benefits include a greater volume of leachate collected and removed, and less maintenance required on pumps, filters and handling systems due to reduced amounts of sediment entering the leachate collection system.

Any construction proposal that includes tire chips as an alternative drainage layer in construction of the leachate collection system should be approved by the Department prior to such construction. Proposals that deviate from these guidelines must also be approved by the Department and must include an appropriate justification for the proposed deviation from these standards.

Specifications for Use

Material Specifications – The recommended nominal tire chip size is 2 inches with an acceptable range of one (1) to four (4) inches in chip size. This size tire material is recommended due to the decreased potential for steel wire protrusion to damage the FML. However, damage may still be possible if tire chips with abnormally large wire protrusions are not screened before being installed above the FML. The Department recommends that the user of the tire chips initiate a quality assurance program that includes inspections of each tire chip load to assure that no more than 10% by volume of the tire chips do not contain steel wire protrusions that exceed one (1) inch in length from the chip.

Construction – The tire chip drainage layer should be a minimum of 12 inches (1 foot) thick under compression. The contractor must consider the lifetime compression rate over the tire chip layer when constructing the tire chip drainage layer. Allowing for compression in the construction phase will ensure that the tire chip layer maintains the minimum required thickness throughout the life of the landfill. Tire chips should not be placed directly in contact with the

FML due to the possibility that steel belts protruding from the chips could puncture the liner. The FML should be protected by a layer of sand or other approved aggregate with a minimum thickness of 12 inches (1 foot) and with a hydraulic conductivity approved by the Solid Waste Environmental Permitting Division of the Mississippi Department of Environmental Quality.

Waste Placement – Wastes that are composed primarily of fine particles should not be placed directly on the tire chips. Contaminated soil, fly ash, wood ash and coal ash are all examples of wastes with high fines content. This practice is recommended to minimize the potential of reducing the hydraulic conductivity of the tire chips and underlying sand layer by infiltration of fine particles.

CQA Report – The overall construction quality assurance report for the landfill cell construction should contain all necessary information regarding the use of the tire chips in construction of the leachate drainage system. At a minimum, the report should include information such as tonnage, approximate number of whole tires utilized and the final pre-compression drainage layer depth.

Questions regarding any of the recommended guidelines described herein as well as any information submitted in adherence with these guidelines should be addressed to Ethan Mayeu or Bruce Laird in the Solid Waste Management Branch of the Mississippi Department of Environmental Quality at 601-961-5171 or at P.O. Box 10385, Jackson, Mississippi 39289-0385. Questions regarding the approval of a leachate collection system design for a municipal solid waste landfill should be addressed to Billy Warden, Chief of the Solid Waste and Mining Branch of the Environmental Permits Division at 601-961-5171 or at P.O. Box 10385, Jackson, Mississippi 39289-0385.