EVALUATION OF THE MOBILITY OF ^{137}CS IN SOIL PROFILES OF THE PANTANAL REGION

Fernanda L. da Silva[1], Daniel Vidal Pérez[2], Péricles L. Picanço Júnior[3], Elaine R. R. Rochedo[4], Ana C. M. Ferreira[1], Celso F. Lapa[5], Nilson Rendeiro[2] and Maria Angélica V. Wasserman[5]

[1] Instituto de Radioproteção e Dosimetria
Comissão Nacional de Energia Nuclear
Avenida Salvador Allende, s/n
22783-127 Rio de Janeiro, RJ
fleite@ird.gov.br
anacris@ird.gov.br

[2] Centro Nacional de Pesquisa de Solos
Empresa Brasileira de Pesquisa Agropecuária
Rua Jardim Botânico, 1024
22460-000 Rio de Janeiro, RJ
chpd@cnps.embrapa.br
nilson.rendeiro@embrapa.br

[3] Instituto BioAtlântica
Rua Goethe, 75
22281-020 Rio de Janeiro, RJ
pericles.picanco@gmail.com

[4] Programa de Engenharia Nuclear
Instituto Militar de Engenharia
Praça General Tibúrcio, 80, 4º andar
22290-270 Rio de Janeiro, RJ
elainerochedo@gmail.com

[5] Instituto de Engenharia Nuclear
Comissão Nacional de Energia Nuclear
Rua Hélio de Almeida, 75
21941-906 Rio de Janeiro, RJ
lapa@ien.gov.br
mwasserman@ien.gov.br

ABSTRACT

Radioactive pollutants can cause impact on the environmental quality of soils and represent a risk to human health. Radioecological studies have shown that soils with low pH, low organic matter content and low fertility are more vulnerable to contamination by ^{137}Cs, since the transfer to plants is high. In this study, some surface horizons of soils from Jaraguari, situated at Brazilian Pantanal were assessed in order to map their vulnerability to contamination by ^{137}Cs. It was also proposed some mitigation measures adapted to the regional scenario in order to optimize radiological protection for rural areas. A conceptual model established to detect the vulnerability of radioactively contaminated soils was applied for soils located in the municipality of Jaraguari (Mato Grosso do Sul). This conceptual model was established based on the relationship between reference values of the soil-to-plant transfer factor (TF) for

^{137}Cs and critical pedological parameters for each radiovulnerability category (pH, CTC and exchangeable K). The application of this conceptual model to a soil databank using Geographic Information System (GIS) tools generated vulnerability soils maps. This result identified that most of Pantanal soils presented very low radiovulnerability, but it was possible to detect some small areas presenting extreme radiovulnerability. It was possible to conclude that these small areas is not indicated for activities that presents a potential risk for ^{137}Cs contamination and also it must receive priority actions for remediation in the case of accident, since a superficial contamination with ^{137}Cs in these areas can lead to a contamination of subsoil and to a significant spread of contamination via groundwater.