

Beam Dump Facility (BDF) at CERN radiological and environmental assessment

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The Beam Dump Facility (BDF), currently in its design phase, is a proposed fixed target facility at CERN, dedicated to the Search for Hidden Particles (SHiP). In order to isolate possibly existing hidden particles a high-density and high-Z target is used to fully absorb the hadronic and electromagnetic particle cascade caused by the impact of a high-intensity 400 GeV/c proton beam. Due to such experimental conditions, high levels of material activation is expected. The evaluation of radiation protection hazards is a challenging aspect for the design of this facility. In particular, high prompt and residual dose rates call for considerable shielding and remote-handling interventions in the target area. Moreover, the risk of an environmental impact stemming from air, water and soil activation heavily influences the design. This paper discusses the results of a radiological study, using FLUKA MC simulations and the ActiWiz code, to assess the above-mentioned radiation protection aspects.

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