

7.0 ALARA ANALYSIS

This As Low As Reasonably Achievable (ALARA) analysis is provided to demonstrate that the proposed no action alternative (with its associated DCGLs) conforms with the philosophy and intent of reducing dose to potentially exposed receptors to levels that are below the regulatory limit in Subpart E of 10 CFR Part 20 (NRC 1997a) for unrestricted release, and are as low as reasonably achievable.

Existing surveys and modeling show that, without remediation, potential future exposures to radioactivity associated with the subsurface source term would result in annual doses that are well below the decommissioning criteria. Radiological fate and transport modeling indicates the subsurface radioactive constituents associated with the site will remain effectively isolated for at least 1,000 years. Expected annual doses to members of the critical exposure group under the various scenarios considered are small fractions of a single millirem.

Dose modeling performed to derive the surface soils DCGL and described in Section 5.0 indicates that a significant concentration of radioactivity would have to be ubiquitously present in a surface-soil source term in order to exceed the regulatory dose limit for decommissioning the site without restriction on future use (NRC 1997a). The proposed surface soils DCGL_w, as reported in Section 14.0 of the DP, is 357 pCi/g Th-232. While it is technically possible for such a concentration to exist, it is extremely unlikely that it does, for many reasons: 1) the highest concentration of radioactivity in the subsurface source term is approximately 800 pCi/g, making it very unlikely that this material could contaminate the surface at a level approaching 357 pCi/g; 2) radiological controls used during prior characterization sampling prevented significant amounts of radioactivity from being brought to the surface; 3) routine monthly gamma-radiation surveys over the cover have not indicated gamma-radiation levels above background levels at the surface; and 4) recent beta/gamma scanning surveys of the surface soils surrounding the former coreholes did not identify radioactivity above background levels. All of the information available about existing radiological surface soil contamination supports the conclusion that residual radioactivity in significant concentration and quantity is not present in the surface soils of the site, and that the site is eligible for unrestricted release.

Based on MDNR's decision to perform remedial activities to meet unrestricted use criteria limits, and using appropriate dose modeling to relate concentrations to dose, the licensee can take advantage of the allowance given in Section 1.5, Appendix D of NUREG-1727 (NRC 2000) which states: "In certain circumstances, the results of an ALARA analysis are known on a generic basis and an analysis is not necessary. For residual radioactivity in soil at sites that will have unrestricted release, generic analysis shows that shipping soil to a low-level waste disposal facility is unlikely to be cost effective for unrestricted release, largely because of the high cost of waste disposal. Therefore shipping soil to a low level waste disposal facility generally does not have to be evaluated for unrestricted release." Therefore, for the Tobico Marsh site the results of

an ALARA analysis are “known on a generic basis” and MDNR has not performed further analysis.

As part of preparing the site for recreational use, MDNR currently plans to cut, cap, and remove above-grade components and piping of the LCTS and to remove the single structure located on the site. These actions will be conducted in accordance with the terms and conditions of MDNR’s radioactive materials license (NRC 1999a). Because the LCTS components and the structure are not contaminated, such measures would not classically be considered as part of the ALARA analysis. However, by removing above-grade structures, MDNR will have removed objects that could otherwise become “attractive nuisances” that invite vandalism.