4. PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

NDMA is not produced for commercial use in the United States (HSDB 1988). The public portion of the U.S. EPA TSCA Production File indicates that during 1977, the Ames Laboratories in Milford, CT and Columbia Organics in Columbia, SC both prepared small research quantities of this chemical. Eastman-Kodak in Rochester, NY and Teledyne McCormick Selph, an importer, supplied no NDMA during 1977, although both had the capability to produce/import this compound and had done so in the past (EPA 1977). Small research quantities of this chemical presently are available from Sigma Chemical Co. and Aldrich Chemical Co. NDMA can be prepared by reaction of nitrous acid with dimethylamine or by addition of acetic acid and sodium

4.2 IMPORT

Data pertaining to the import of NDMA into the U.S. were not located in the available literature.

4.3 USE

NDMA is prepared in laboratory-scale quantities solely for use as a research chemical (HSDB 1988). NDMA was formerly used (prior to April 1, 1976) as an intermediate in the production of l,l-dimethylhydrazine, a storable liquid rocket fuel, which was believed to have contained up to 0.1% NDMA as an impurity (IARC 1978). NDMA has also been used or has been proposed for use as an antioxidant, additive for lubricants, and as a softener for copolymers (Windholz 1983). NDMA has also been used as a solvent and rubber accelerator (Hawley 1981).

4.4 DISPOSAL

Combustion in an incinerator equipped with an afterburner and NOx scrubber is the recommended method for disposing NDMA. Liquid wastes should be neutralized, if necessary, filtered to remove solids, and then put into closed polyethylene containers for transport. All equipment should be thoroughly rinsed with solvent, which should be added to the liquid waste for incineration. Great care should be practiced to insure that there is no contamination on the outside of the solvent container. If possible, solid waste should also be incinerated. If this is not possible, the nitrosamine should be extracted from the waste and the extract should be handled as a liquid waste. Any rags, papers or other materials which are contaminated during the disposal process should be incinerated. Contaminated solid materials should be enclosed in sealed plastic bags that are labeled cancer suspect agent, with the name and amount of carcinogen. Bags should be stored in well-ventilated areas until they are incinerated (HSDB 1988). Nitrosamine residues generated in laboratory research or accidental spills

in research laboratories should be diluted to a concentration of less than 10 μg/L and then reduced to innocuous amines, ammonia, or alcohols by aluminum-nickel alloy powder and aqueous alkali. This method of disposal is applicable to a variety of media (water, mineral oil, olive oil, dimethylsulfoxide, solutions of agar gel), but is not recommended for use in solutions of acetone or dichloromethane because reactions are slow and incomplete. After the reduced reaction mixture is filtered, the liquid can be disposed of by pouring it over a sufficient amount of absorbent material to convert it to a solid waste for incineration. The filtercake is discarded with non-burnable solid wastes (HSDB 1988). Other methods of destruction of NDMA in laboratory wastes (e.g., using hydrobromic acid or potassium permanganate/sulfuric acid) are described by IARC (1982).

4.5 ADEQUACY OF THE DATA BASE

Section 104 (i) (5) of CERCLA, directs the Administrator of ATSDR (in consultation with the Administrator of EPA and agencies and programs of the Public Health Service) to assess whether adequate information on the health effects of NDMA is available. Where adequate information is not available, ATSDR, in cooperation with the National Toxicology Program (NTP), is required to assure the initiation of a program of research designed to determine these health effects (and techniques for developing methods to determine such health effects). The following discussion highlights the availability, or absence, of exposure and toxicity information applicable to human health assessment. A statement of the relevance of identified data needs is also included. In a separate effort, ATSDR, in collaboration with NTP and EPA, will prioritize data needs across chemicals that have been profiled.

4.5.1 Data Needs

Production, Use, Release, and Disposal. Uses, methods of synthesis, and methods of disposal for NDMA are described in the literature and there does not appear to be a need for further information on these topics. Lack of information pertaining to the import of this compound is not surprising since this compound has no commercial applications. Data regarding the amount of NDMA released to air, water, and soil would be useful in order to establish potential sources of exposure and levels of exposure from environmental media. In particular, information releases from hazardous waste landfills and industries in which this compound is inadvertently formed may help determine whether people living in the vicinity of these sites are exposed to elevated levels of this compound. According to the Emergency Planning and Community Right to Know Act of 1986 (EPCRTKA), (§313), (Pub. L. 99-499, Title III, §313), industries are required to submit release information to the EPA. The Toxic Release Inventory (TRI), which contains release information for 1987, became available in May of 1989. This database will be updated yearly and should provide a more reliable estimate of industrial production and emission.