

f. What Are the Risk Assessment Results for Nonwastewaters?

We developed mass loading limits for nonwastewaters managed in a landfill. We calculated risk-based mass loading limits for the air and groundwater pathways. Table III-2 shows the loading limits derived from probabilistic analysis for the landfill groundwater pathway for several liner scenarios: No liner (NL), a compacted clay liner (CL), and a range of composite synthetic/clay liner (SL).

Reviewers should note that inputs used in the modeling to support today's proposal may change, and minor modifications to the model itself may be made as a result of ongoing internal quality assurance/quality control reviews and public comments. As a consequence, the proposed constituent levels may change as well. Reviewers should bear in mind that levels that increase or decrease sufficiently could

result in adding or deleting constituents from the listing, based on whether the risk-based levels are likely to occur in dyes and/or pigments production wastes.

We propose to eliminate constituents from further consideration for nonwastewaters if the calculated allowable loading exceeds 10,000 kg/yr. Our basis for this is that mass loading limits for nonwastewaters in excess of 10,000 kg/yr are implausible, because such a loading would require waste concentrations that are unlikely to occur. For example, using our estimated average annual quantity of wastewater treatment sludge (1,894 metric tons/year (MT/yr)),³² a loading of 10,000 kg/yr would correspond to a waste concentration above 5,000 ppm. Such a high concentration is highly unlikely in typical nonwastewaters, as shown by the available analytical data for dye and/or pigment wastes.³³ The results in

Table III-2 only show the results for the constituents that yielded loadings that were below the 10,000 kg/yr level ($>1.0\text{E}+04$). The modeling for the groundwater pathway yielded loading limits less than 10,000 kg/yr for 12 out of the 35 constituents of concern for the unlined landfill scenario. Modeling of compacted clay lined landfills yielded eight loading limits less than 10,000 kg/yr; while modeling the range of composite liners which we call the "SL" scenario yielded only one such loading limit. (See the Risk Assessment Background Document for the full modeling results).

In contrast, the results for the air pathway for all landfill scenarios did not show any levels of concern, *i.e.*, the loading limits were all above 10,000 kg/yr. Details for this analysis can be found in the Risk Assessment Background Document.

TABLE III-2.—MASS LOADING LIMITS FOR POSSIBLE CONSTITUENTS OF CONCERN IN LANDFILLS: GROUNDWATER PATHWAY

Chemical	CAS No.	Mass loading (kg/yr)		
		NL	CL	SL
Toluene-2,4-diamine	95-80-7	0.34	0.99	140
2,4-Dimethylaniline (2,4-xylidine)	95-68-1	21	100	$>1.0\text{E}+04$
4-Chloroaniline	106-47-8	630	4,800	$>1.0\text{E}+04$
o-Anisidine	90-04-0	30	110	$>1.0\text{E}+04$
Benzidine	92-87-5	120	$>1.0\text{E}+04$	$>1.0\text{E}+04$
p-Cresidine	120-71-8	120	660	$>1.0\text{E}+04$
1,2-Phenylenediamine	95-54-5	160	710	$>1.0\text{E}+04$
1,3-Phenylenediamine	108-45-2	300	1,200	$>1.0\text{E}+04$
Lead	7439-92-1	1,300	4,900	$>1.0\text{E}+04$
Aniline	62-53-3	1,900	9,300	$>1.0\text{E}+04$
N,N-Dimethylaniline	121-69-7	2,500	$>1.0\text{E}+04$	$>1.0\text{E}+04$
1,4-Phenylenediamine	106-50-3	6,500	$>1.0\text{E}+04$	$>1.0\text{E}+04$

NL = limits for unlined landfill scenario.

CL = limits for clay-lined landfill scenario.

SL = limits for composite liner landfill scenario.

In addition to the results shown in Table III-2, we also conducted a screening analysis for sodium nitrite; the resulting loading limits were calculated to be 493 kg/yr, 740 kg/yr, and 19,720 kg/yr for the unlined, clay-lined, and composite-lined (SL) landfill scenarios.³⁴ Nitrite exists in the environment in a complex equilibrium with other forms of nitrogen, including less toxic nitrate, ammonia, and nitrogen gas. Equilibrium is affected by a variety of factors, and nitrite levels would be driven by the complex

nitrogen cycle and the landfill and subsurface conditions. While we know nitrite is converted to nitrate and nitrogen under various conditions, our models were not able to quantify these processes. Also, we assumed that nitrite migrates with no significant adsorption ($K_d=0$). Therefore, we view the modeling results for sodium nitrite as a conservative screening analysis, because we used a variety of simplifying assumptions.

Only two facilities reported any TRI releases of sodium nitrite through offsite

disposal (which we assume are releases of nonwastewaters), with the larger release being 363 kg (the other was 2 kg). This larger release is still below the very conservative loadings from our screening analyses for the three landfill scenarios. Furthermore, given the solubility of sodium nitrite, it seems unlikely that it could be present in any wastewater treatment sludges in significant amounts, but would preferentially partition to the wastewater. This is supported by the TRI data, which show that nearly all of

³² See the Economic Analysis Background Document for a full description of our estimation of waste quantities.

³³ See the summary of analytical data in the Listing Background Document. Exceptions include high organic wastes, such as still bottoms, however these are relatively rare and are reportedly treated by combustion (*i.e.*, are not sent to a landfill). See,

for example, Attachment C to the comments from BASF on the 1994 proposal, available in the docket for today's rule.

³⁴ Note that the Risk Background Document presents the loading limits for sodium nitrite in terms of "nitrogen," rather than the complete sodium nitrite molecule (NaO_2). This occurs because the toxicity benchmark for sodium nitrite

is given in terms of "nitrogen." The TRI data are given for total mass of sodium nitrite. Therefore, for comparison to the TRI data, the loading limits are converted to the molecular formula for sodium nitrite; this requires multiplying the loadings given in terms of "nitrogen" by a factor of 4.93.