5.3.4.2 Existing Facilities Associated with High-Level Waste Management

The facilities in this group are those that have historically been used at the INTEC to generate, treat, and store HLW. Because of the number of facilities involved, DOE has grouped them in functional groups for purposes of analysis (see Table 3-***3***). DOE analyzed the HLW tanks and bin sets for closure under all five disposition scenarios; however, facilities that support the Tank Farm and bin sets were analyzed under a single disposition alternative. As shown in Table 3-***3***, the facility disposition alternative for most supporting facilities is Closure to Landfill Standards. (Two exceptions are the Liquid Effluent Treatment and Disposal Building and the West Side Waste Holdup projects, which would be dispositioned by Clean Closure. Emissions from disposition of the Tank Farm and bin sets are shown in Table 5.3-***6***. DOE estimated emissions from all other facilities for the one or two closure scenarios as identified in Section 3.2; the results are in Table 5.3-*7*.

DOE estimated emissions for the maximum year and over the entire duration of each project. Radionuclide emissions would result primarily from the mechanical disturbance of contaminated surfaces. These emissions would be minimized by the use of control systems such as enclosures with high efficiency particulate air filtration systems, and would be discharged through controlled release points (such as the INTEC Main Stack). Use of fuel-burning equipment (e.g., cranes, trucks) is the primary source of nonradiological pollutants, which would be released near ground-level. The disturbance of ground surfaces by vehicles would also result in the generation of fugitive dust. As a result of differences in release conditions, the location of maximum impact is different for radiological than for nonradiological impacts.

DOE also assessed the radiation doses and nonradiological impacts that would be associated with dispositioning the Tank Farm, bin sets, and other facilities. Figures 5.3-***4*** through 5.3-***6*** compare the results of the assessments for the Tank Farm, bin sets, and related facilities under the alternative closure scenarios. Figures 5.3-*7* through 5.3-***9*** show the radiological and nonradiological impacts of dispositioning other existing facilities. All radiological and nonradiological ambient air impacts would be well below applicable standards.

Table 5.3-6. Summary of annual and cumulative emissions from disposition of the Tank Farm and bin sets under alternative closure scenarios.

Facility	Pollutant	Units	Maximum annual and total emissions [a]			
			Clean closure	Performance-based closure	Closure to landfill standards	Performance-based closure with Class A or C grout disposal
Tank Farm	Radionuclides[b]	Curies per year	8.6×10^{-7}	1.1×10^{-7}	7.8×10^{-7}	1.1×10^{-7}
		Total curies	1.5×10^{-5}	1.8×10^{-6}	1.3×10^{-5}	2.5×10^{-6}
	Criteria pollutants[c]	Tons per year	43	8.5	6	5.3
		Total tons	730	140	100	110
	Toxic air pollutants	Tons per year	0.024	4.8×10^{-3}	3.4×10^{-3}	3.0×10^{-3}
		Total tons	0.41	0.081	0.057	0.06
	Carbon dioxide[d]	Tons per year	1.5×10^{3}	180	130	110
		Total tons	2.6×10^{4}	3.0×10^{3}	2.1×10^{3}	***2.2×10^{3}***
	Fugitive dust	Tons per year	130	19	19	37
		Total tons	2.2×10^{3}	150	***150***	670
Bin Sets	Radionuclides[b]	Curies per year	1.3×10^{-7}	1.7×10^{-7}	1.2×10^{-6}	1.7×10^{-7}
		Total curies	2.6×10^{-6}	3.4×10^{-6}	$2.4\text{x}10^{-5}$	2.5×10^{-6}
	Criteria pollutants[c]	Tons per year	2.1	1.8	1.8	2.7
		Total tons	42	36	36	33
	Toxic air pollutants	Tons per year	1.2×10^{-3}	1.0×10^{-3}	1.0×10^{-3}	1.5×10^{-3}
		Total tons	0.024	0.02	0.02	0.015
	Carbon dioxide[d]	Tons per year	44	37	38	55
		Total tons	870	740	760	680
	Fugitive dust	Tons per year	53	33	33	66
		Total tons	***1.1×10^{3}***	660	660	860

a. Maximum annual emissions represent the highest emission rate for any single year; total emissions value is the product of annual emissions for each activity (project) required to support the closure alternative and the duration (in years) of that activity.

b. Radionuclide emissions would consist primarily of strontium-90/yttrium-90 and cesium-137, with small amounts of transuranic isotopes (plutonium, americium, etc.). For Tank Farm waste, the assumed fractions are 48.6 percent strontium-90/yttium-90; 51.1 percent cesium-137; and 0.33 percent transuranics; for bin set waste, the assumed values are 89.7 percent strontium-90/yttrium-90; 10.3 percent cesium-137; and 0.003 percent transuranics.

c. The specific pollutants and approximate relative percentages are as follows: carbon monoxide - 45 percent; sulfur dioxide - 7 percent; nitrogen dioxide - 38 percent; particulate matter - 2 percent; and volatile organic compounds - 8 percent.

d. Carbon dioxide is listed because this gas has been implicated in global warming.

Table 5.3-7. Summary of maximum annual and cumulative emissions from decontaminating and decommissioning other existing facilities associated with HLW management.

Facility Group[b]	Maximum annual emission rate and total emissions[a]									
	Radionuclides[c]		Criteria pollutants[d]		Toxic air pollutants		Carbon dioxide[e]		Dust	
	Curies per year	Curies	Tons per year	Tons	Tons per year	Tons	Tons per year	Tons	Tons per year	Tons
Tank Farm-related (ancillary) facilities	***7.3×10^{-8}***	3.8×10^{-7}	***65***	***340***	***0.036***	***0.19***	***1.3×10^{3}***	***6.7×10^{3}***	0.72	4.3
Bin set-related (ancillary) facilities	8.7×10^{-8}	5.2×10^{-7}	450	2.7×10^{3}	0.25	1.5	9.3×10^{3}	5.6×10^{4}	0	0
Process Equipment Waste Evaporator and Related Facilities	***1.0×10^{-7}***	***5.5×10^{-7}***	***440***	2.5×10^{3}	***0.25***	1.4	***8.8×10^{3}***	***5.0×10^{4}***	***66***	390
Fuel Processing Building and Related Facilities										
Performance-based closure	1.7×10^{-7}	1.7×10^{-6}	150	1.5×10^{3}	0.084	0.84	***3.0×10^{3}***	***3.0×10^{4}***	71	710
Closure to landfill standards	1.7×10^{-7}	1.7×10^{-6}	150	1.5×10^{3}	0.084	0.84	***3.0×10^{3}***	***3.0×10^{4}***	71	710
FAST and Related Facilities	5.8×10^{-8}	3.5×10^{-7}	50	300	0.028	0.17	1.1×10^{3}	***6.0×10^{3}***	120	690
Transport Lines Group	–	–	36	36	-	-	750	750	7.2	7.2
New Waste Calcining Facility[f]										
Performance-based closure	5.8×10^{-8}	1.7×10^{-7}	50	150	0.028	0.84	***1.0×10^{3}***	3.1×10^{3}	63	190
Closure to landfill standards	5.8×10^{-8}	1.7×10^{-7}	50	150	0.028	0.84	***1.0×10^{3}***	3.1×10^{3}	63	190
Remote Analytical Laboratory	2.9×10^{-8}	1.7×10^{-7}	33	200	-	-	680	***4.1×10^{3}***	8.6	52

a. Maximum annual emissions represent the highest emission rate for any single year and are the sum of annual emission rates for each activity within a group that may occur during a common year; total emissions value is the product of cumulative emissions (annual rate multiplied by duration in years) for each individual activity within a group.
b. See Table 3-*3* for facility disposition alternatives that apply to each group. The Fuel Processing Building and Related Facilities and the New Waste Calcining Facility could be dispositioned by either performance-based closure or closure to landfill standards. Individual facilities within all other groups would be dispositioned according to a single closure method.
c. Radionuclide emissions would consist primarily of strontium-90/yttrium-90 and cesium-137, with much smaller amounts of transuranic isotopes.
d. The specific pollutants and approximate relative percentages are as follows: carbon monoxide – 45 percent; sulfur dioxide - 7 percent; nitrogen dioxide - 38 percent; particulate matter - 2 percent; and volatile organic compounds - 8 percent.
e. Carbon dioxide is listed because this gas has been implicated in global warming.
f. The decontamination and decommissioning of this facility is also included in some of the waste processing alternatives presented in Table 5.3-4.

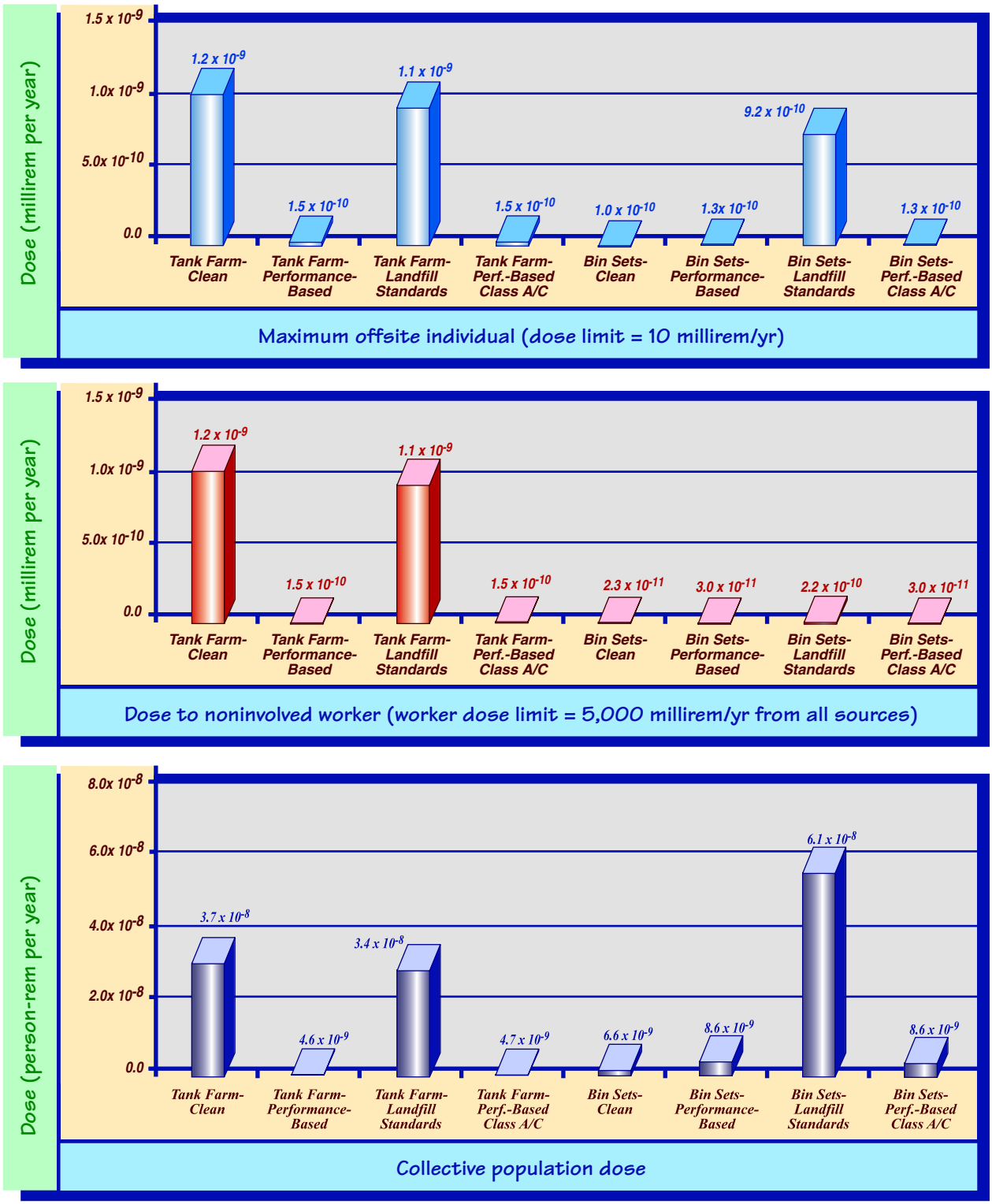
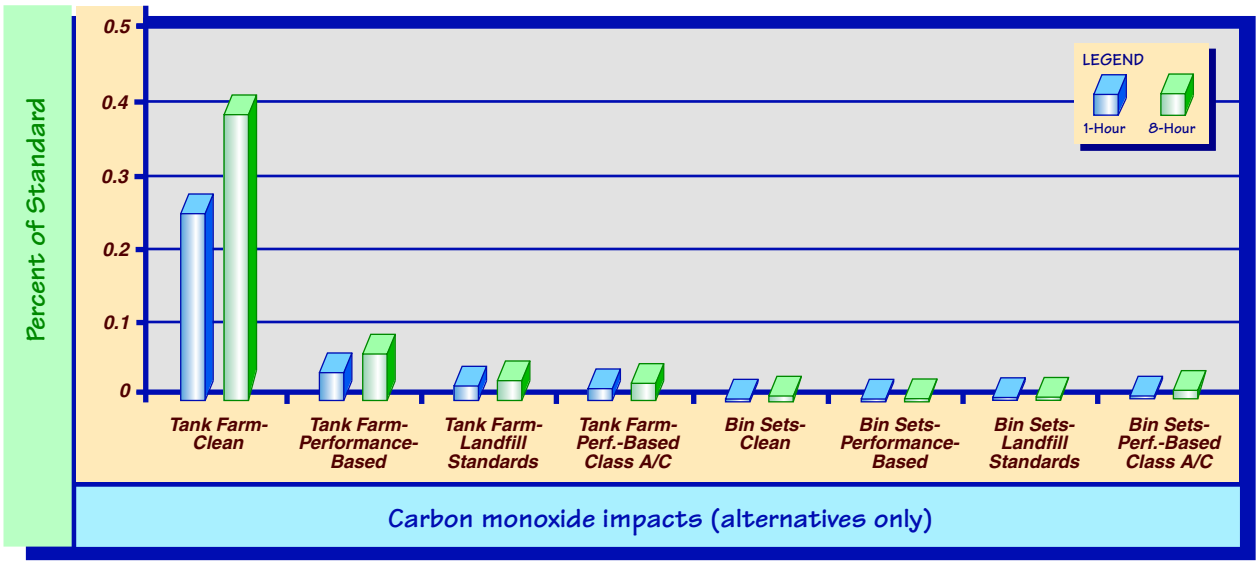


FIGURE 5.3-4.
Air pathway doses by Tank Farm and bin set closure option.



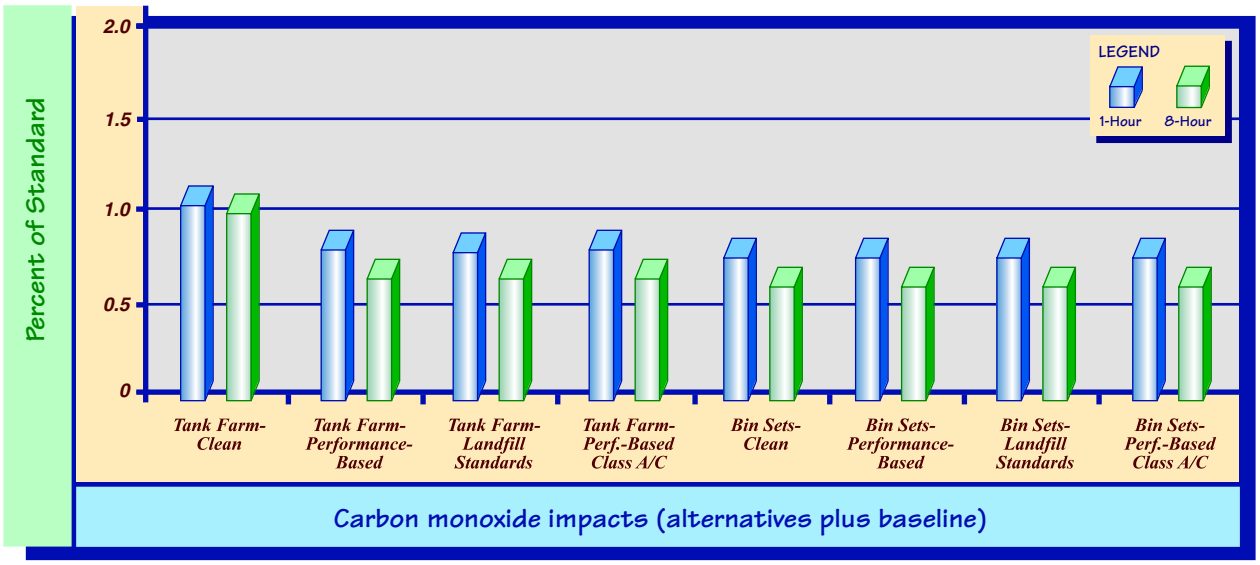
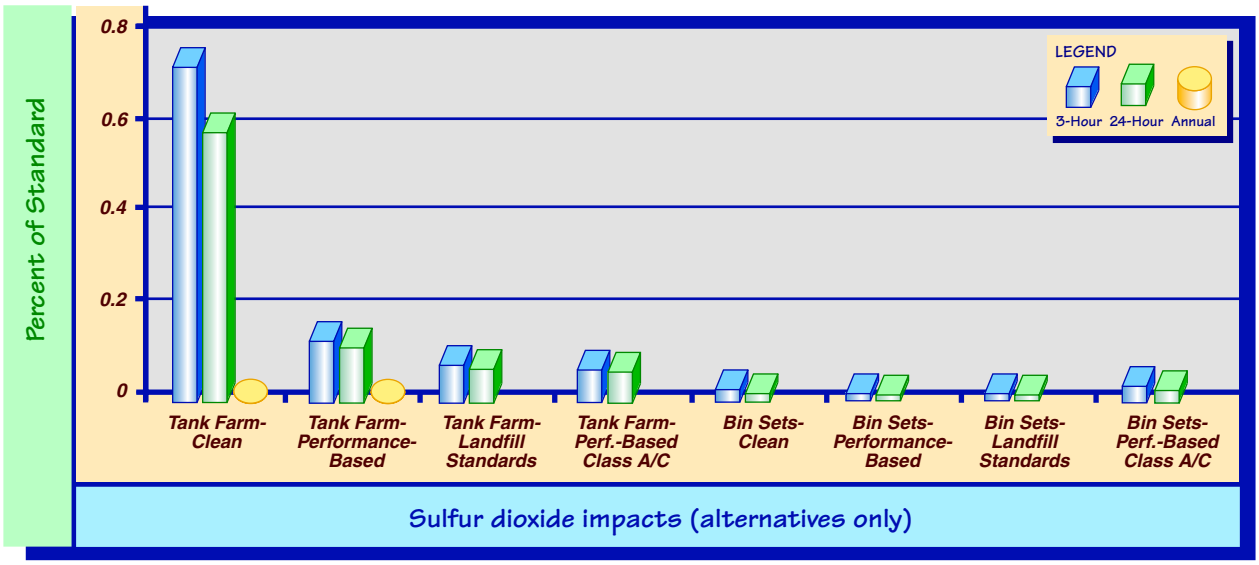


FIGURE 5.3-5. (1 of 4)
Criteria air pollutant impacts by Tank Farm and bin set closure alternative.



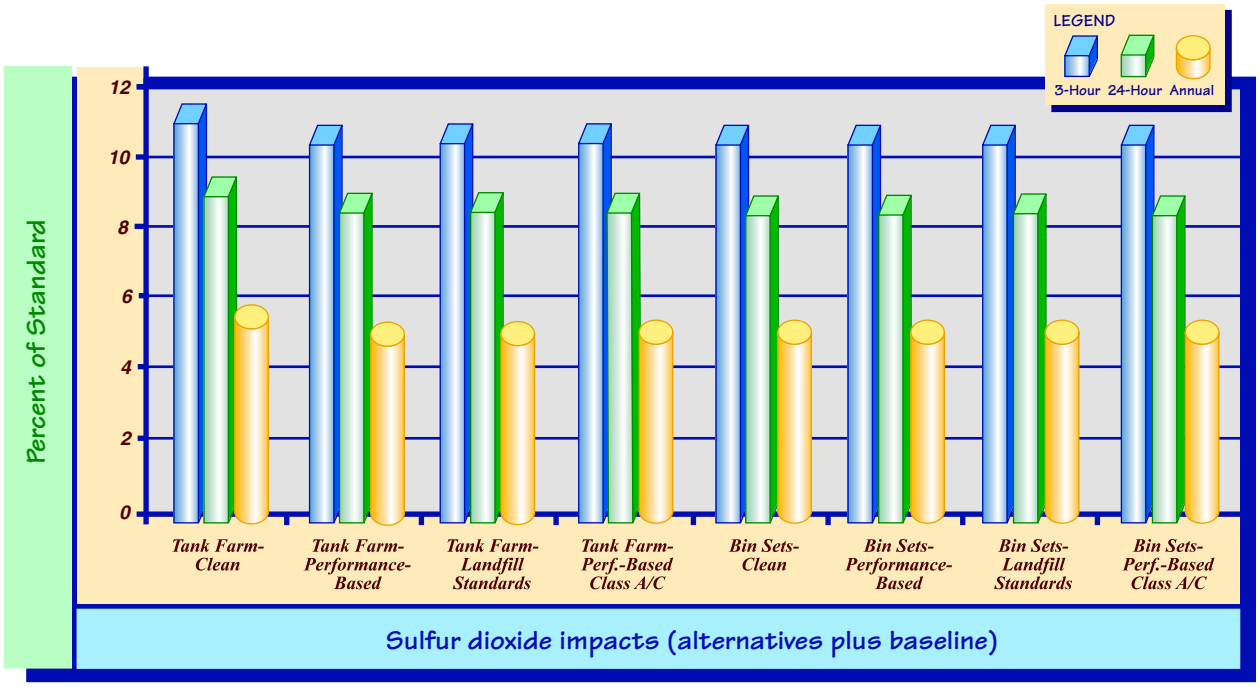
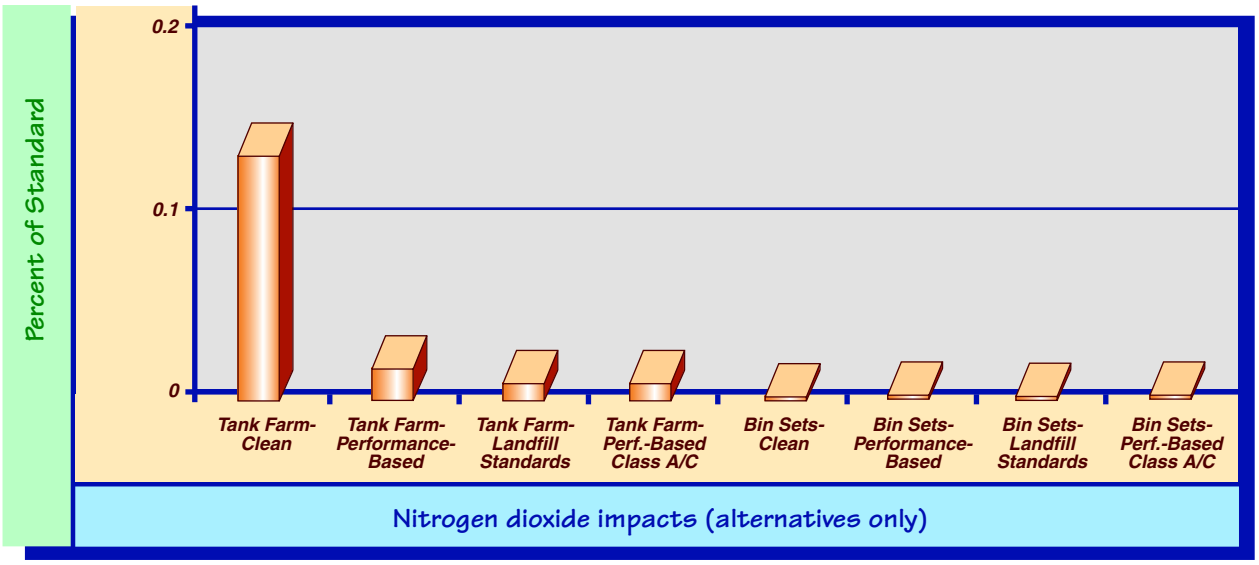


FIGURE 5.3-5. (2 of 4)
Criteria air pollutant impacts by Tank Farm and bin set closure alternative.



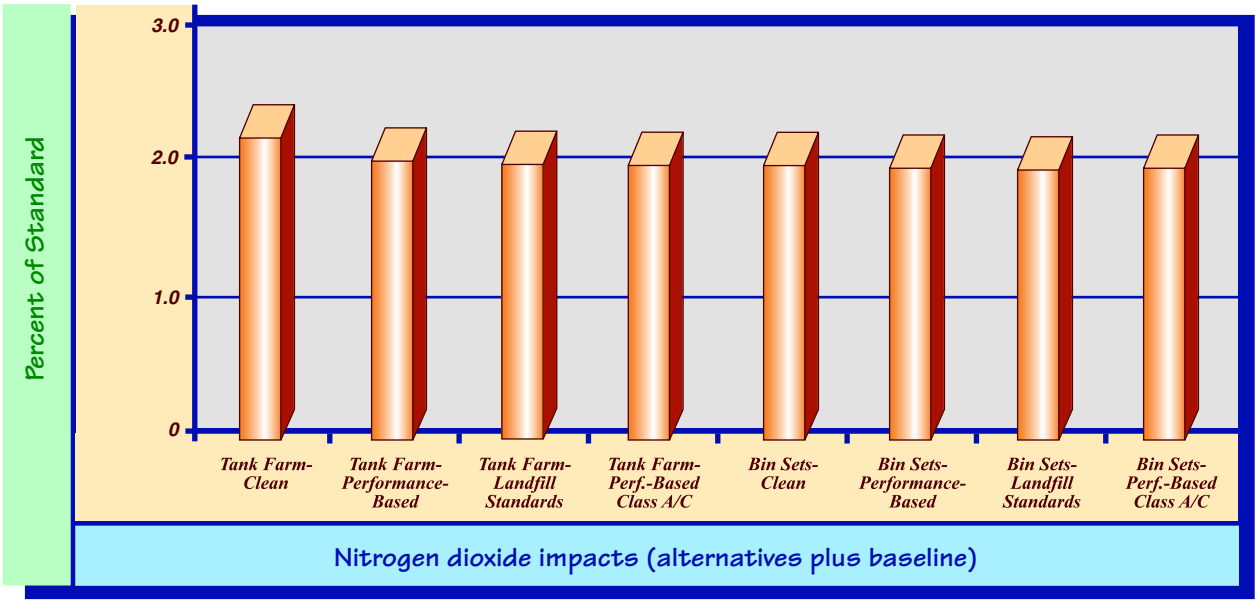
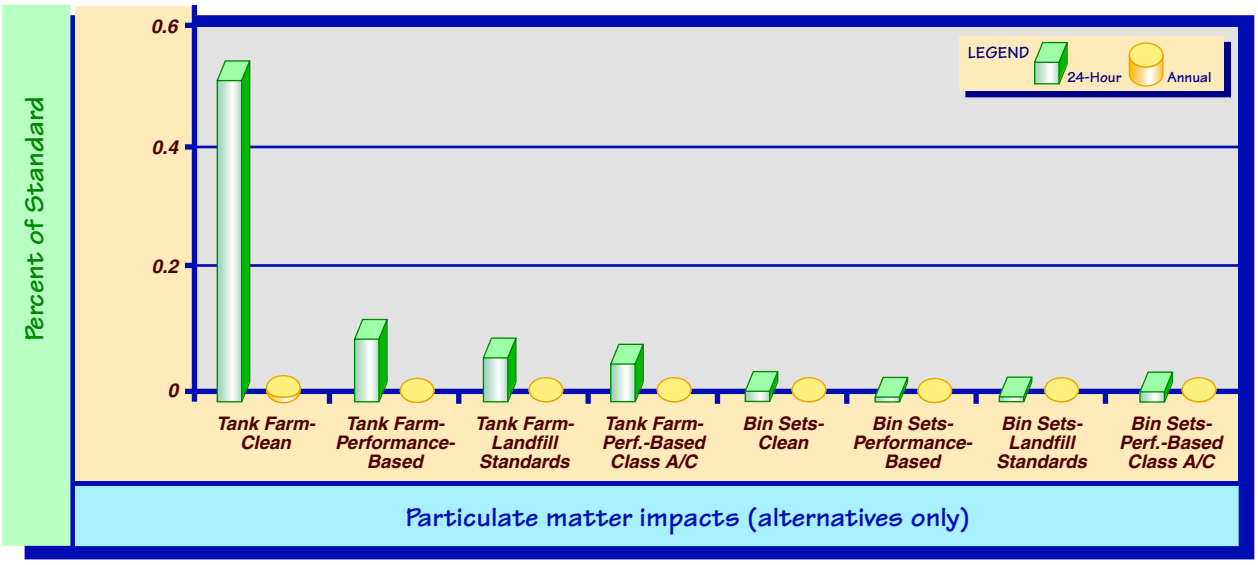


FIGURE 5.3-5. (3 of 4)
Criteria air pollutant impacts by Tank Farm and bin set closure alternative.



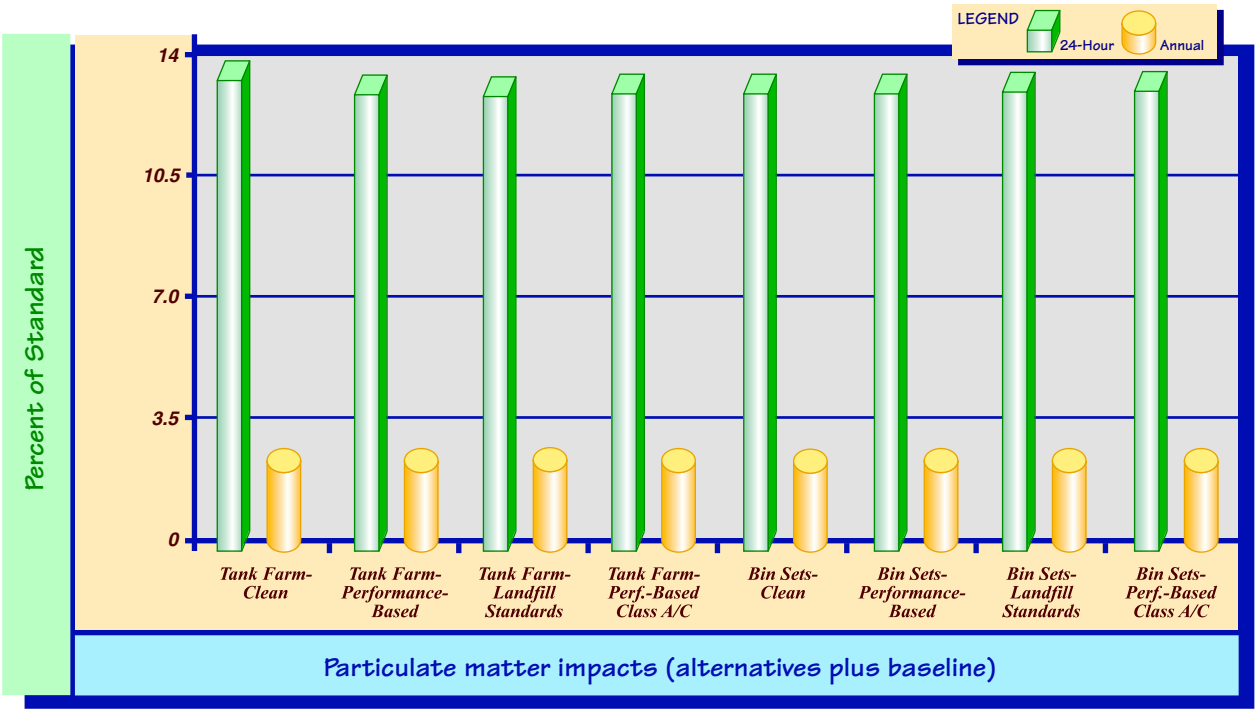
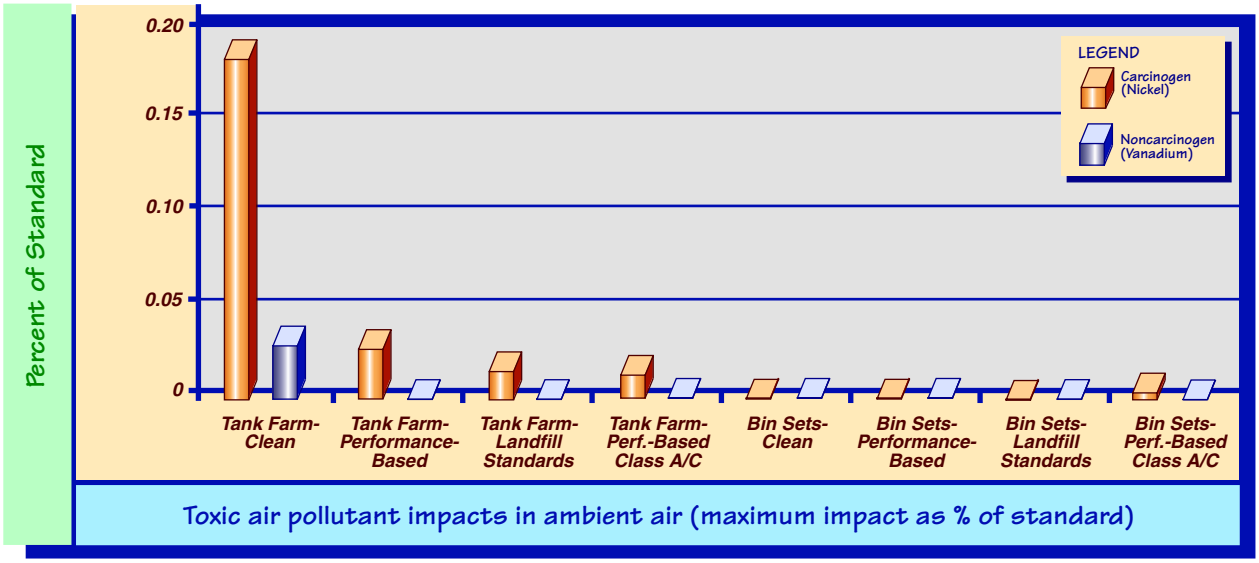


FIGURE 5.3-5. (4 of 4)
Criteria air pollutant impacts by Tank Farm and bin set closure alternative.



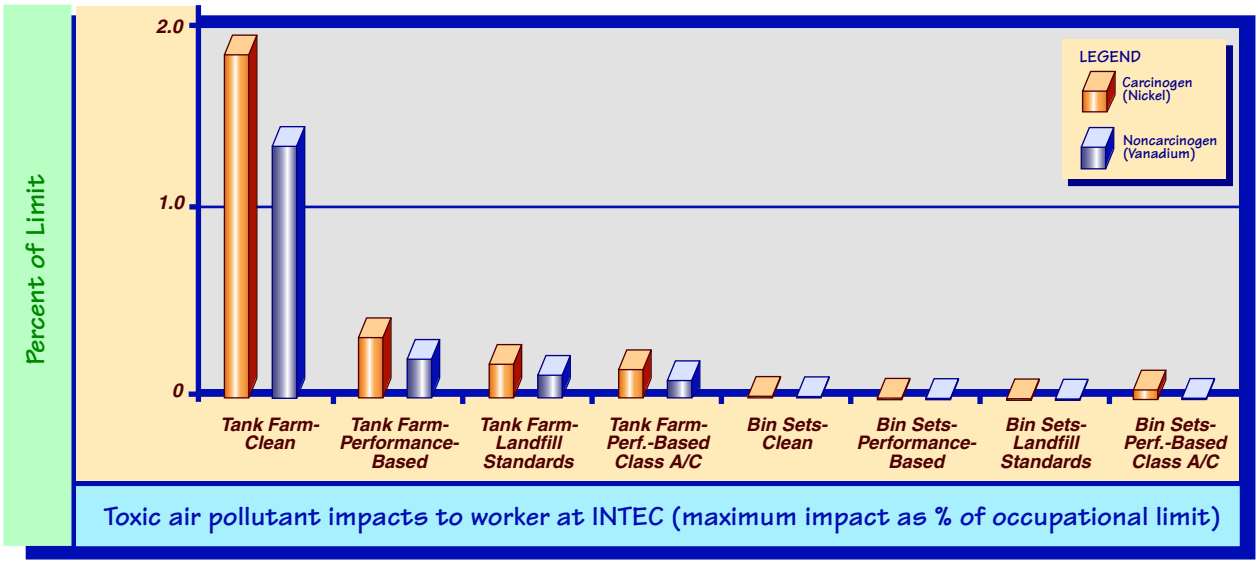
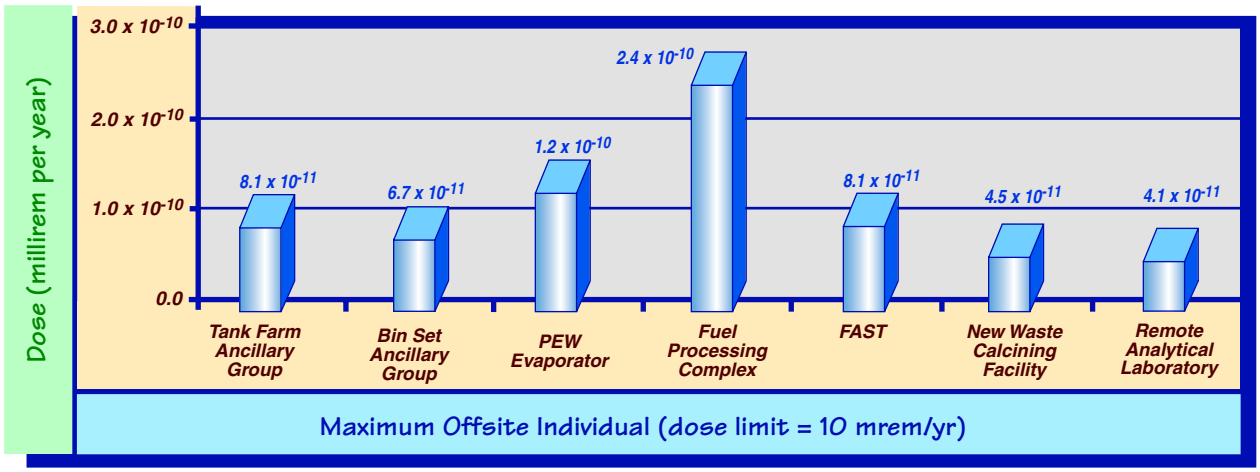
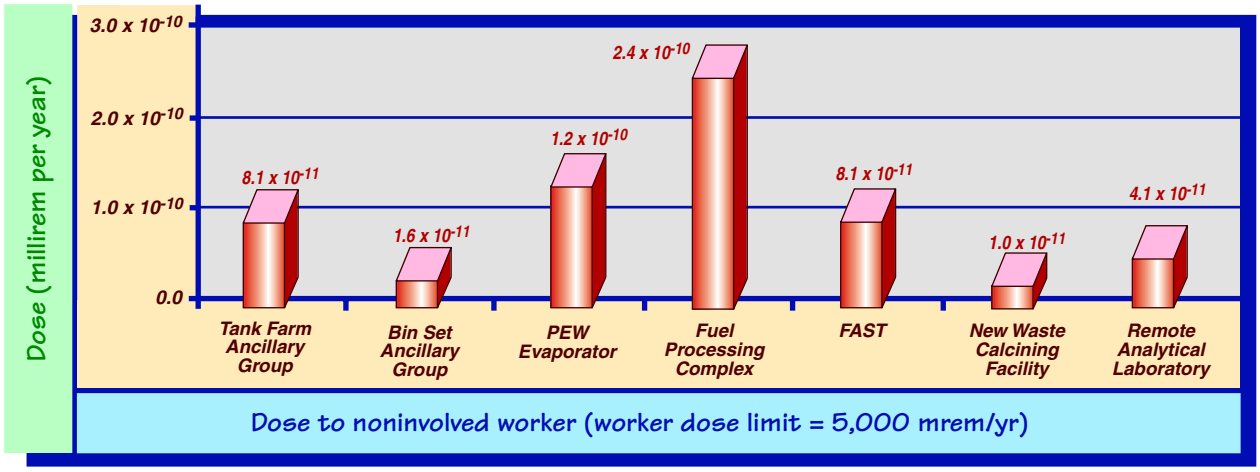


FIGURE 5.3-6.
Toxic air pollutant impacts for Tank Farm and bin set closure options.





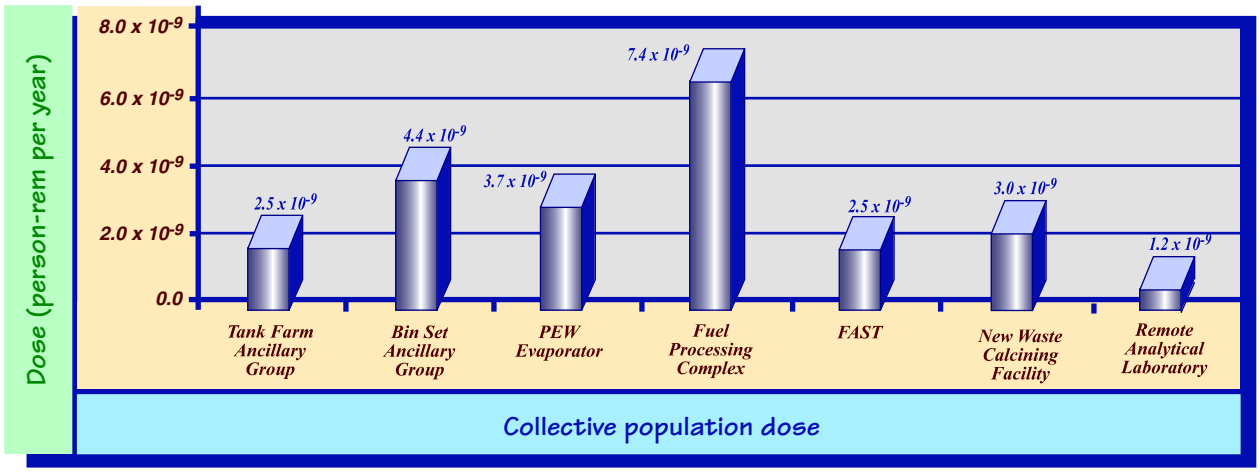
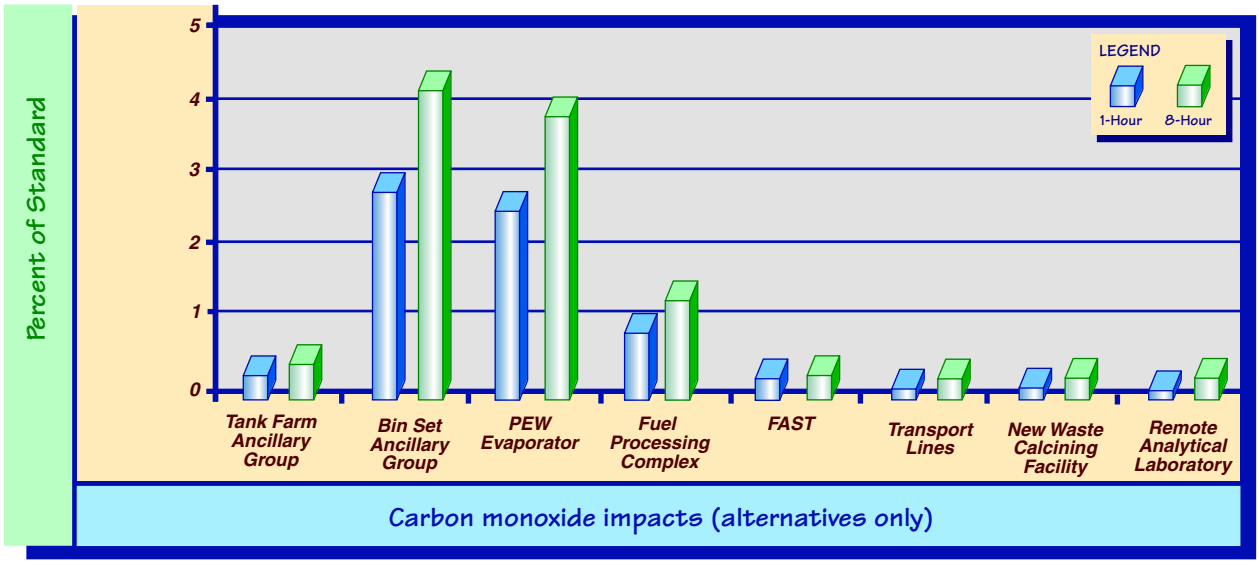


FIGURE 5.3-7.
Air pathway doses for disposition of existing INTEC facilities associated with HLW management.



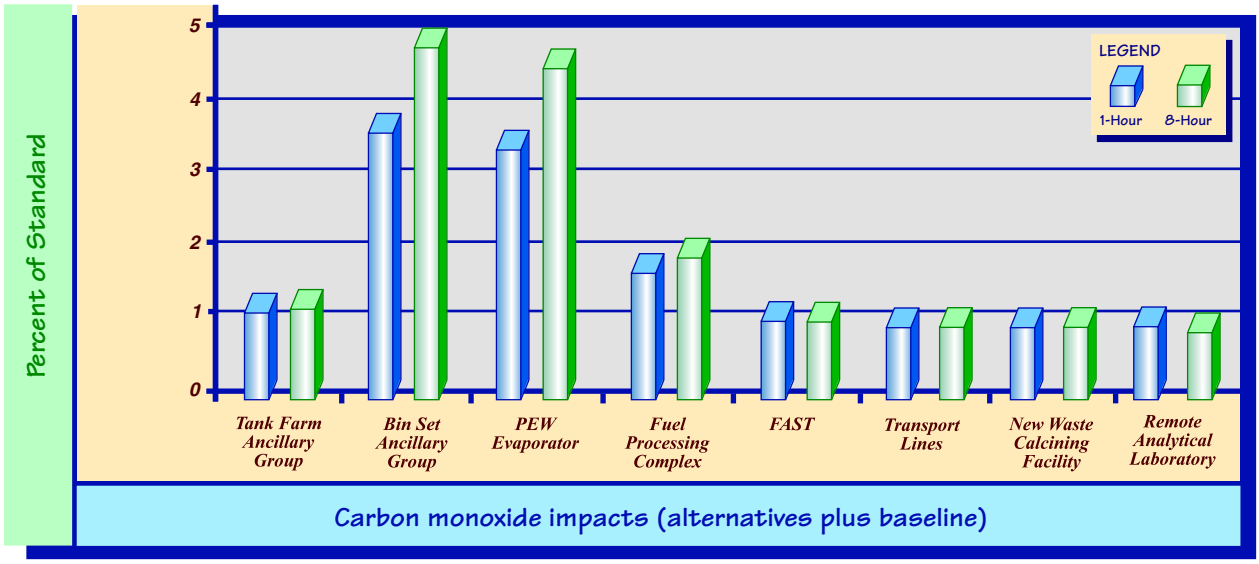
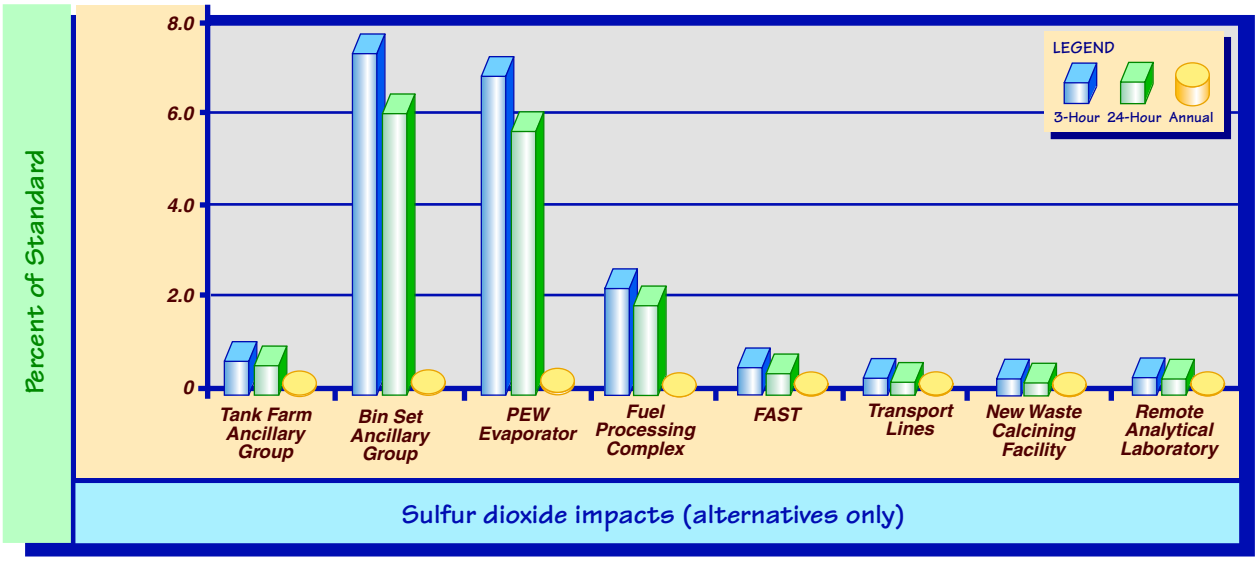


FIGURE 5.3-8. (1 of 4)
Comparison of criteria air pollutant impacts for disposition of existing INTEC facilities associated with HLW management.



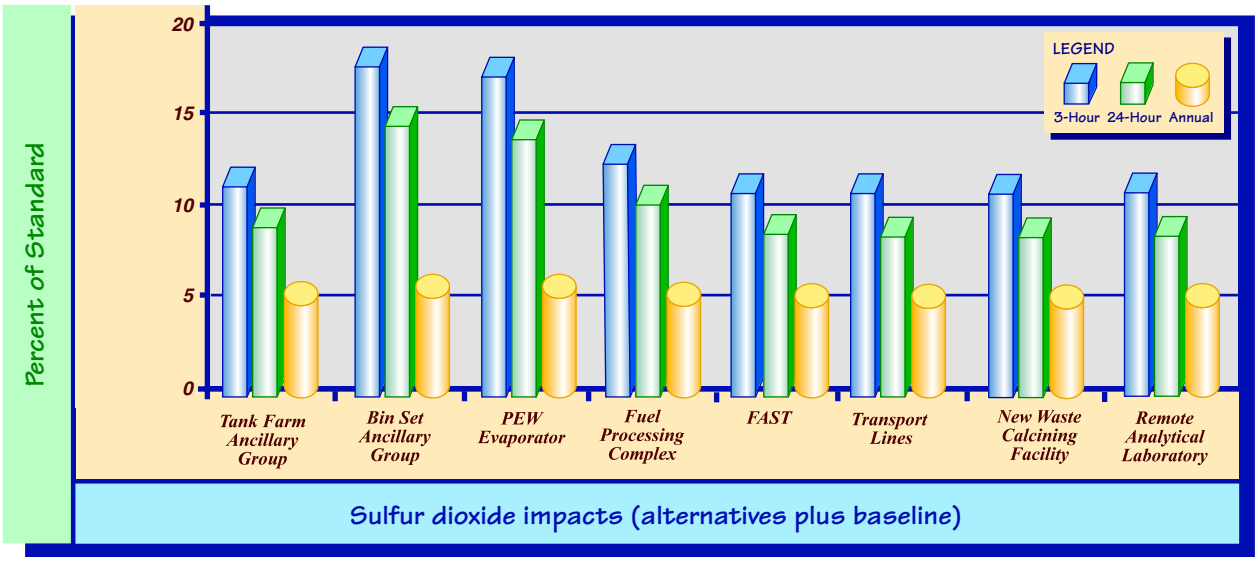
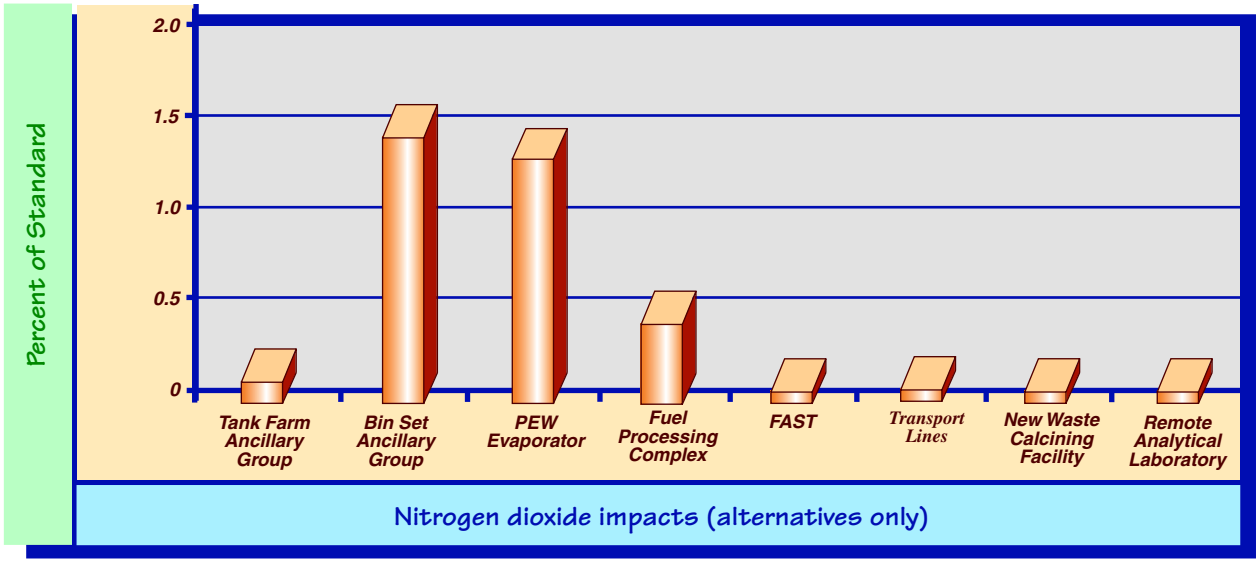


FIGURE 5.3-8. (2 of 4)
Comparison of criteria air pollutant impacts for disposition of existing INTEC facilities associated with HLW management.



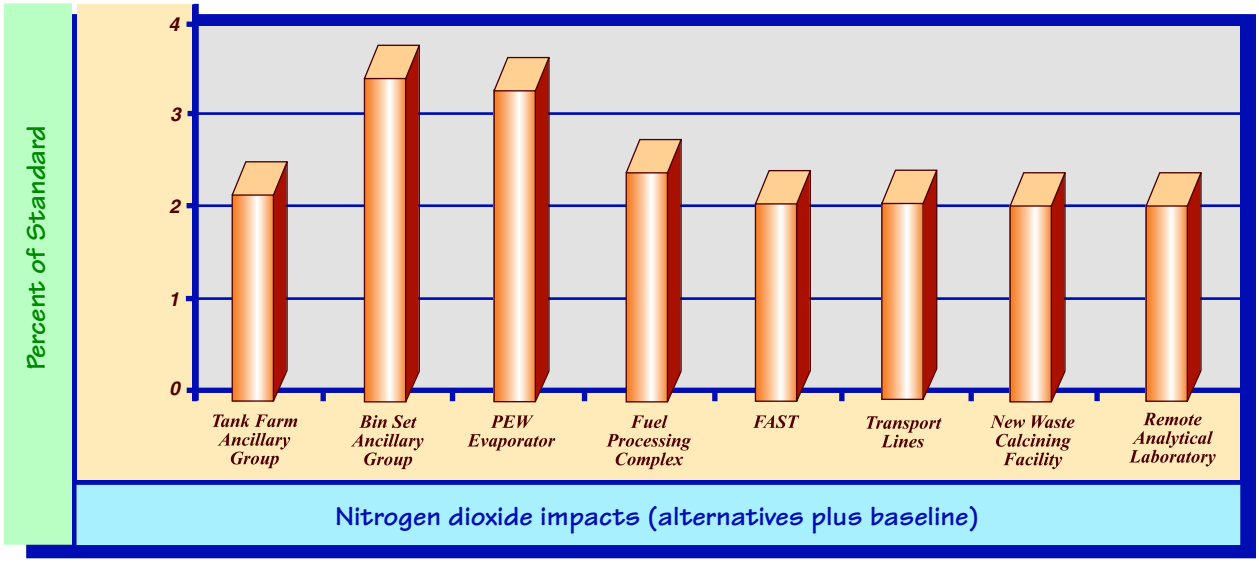
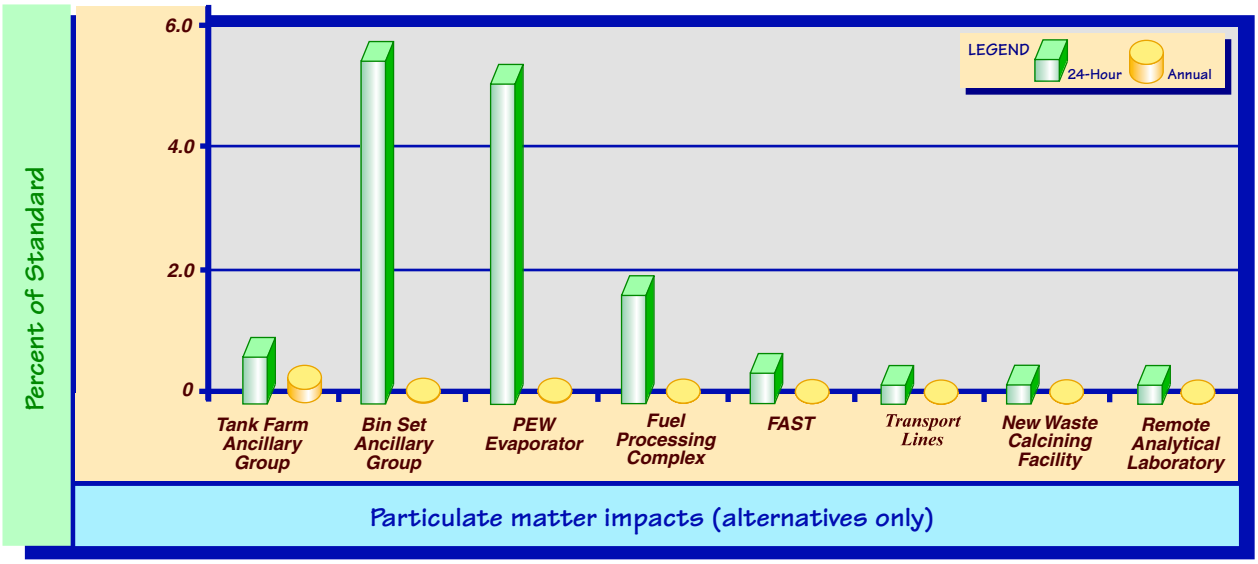


FIGURE 5.3-8. (3 of 4)
Comparison of criteria air pollutant impacts for disposition of existing INTEC facilities associated with HLW management.



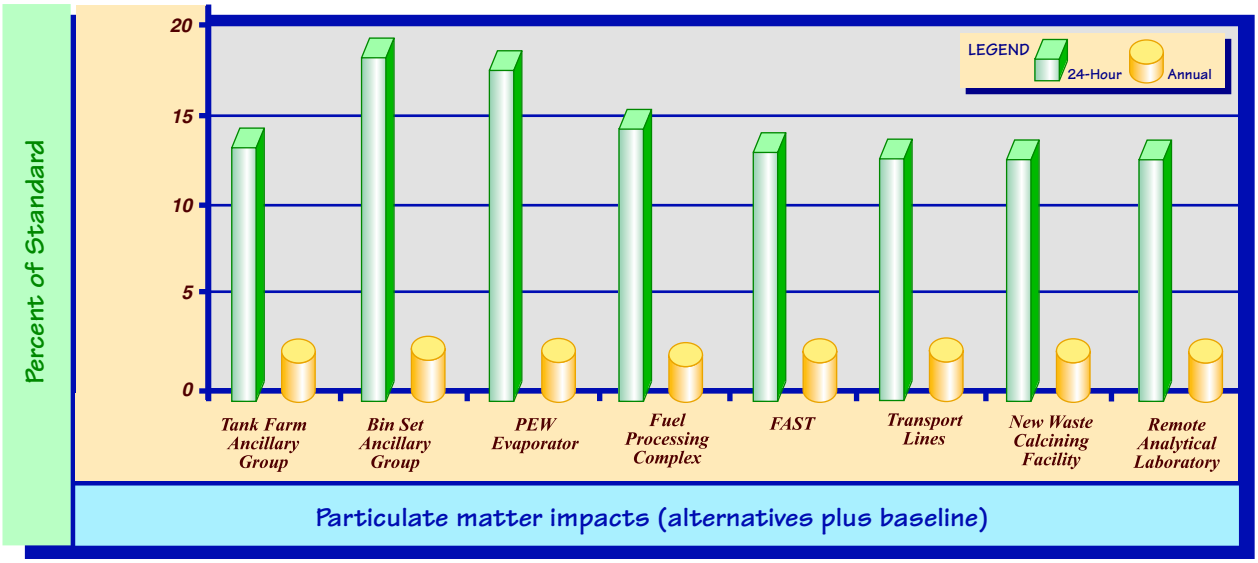
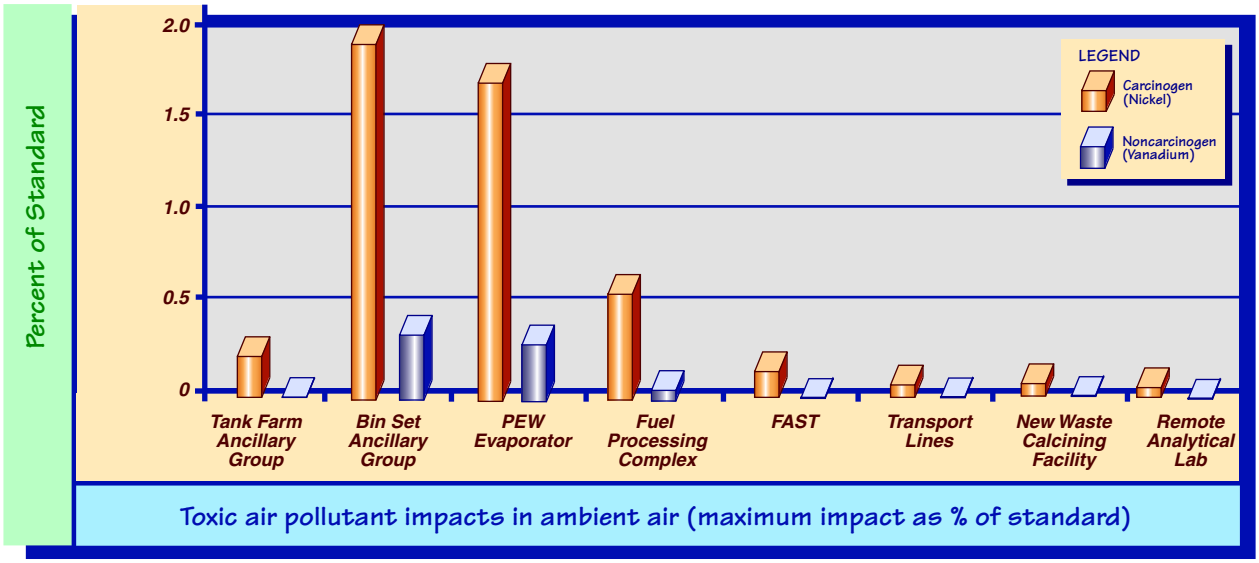


FIGURE 5.3-8. (4 of 4)
Comparison of criteria air pollutant impacts for disposition of existing INTEC facilities associated with HLW management.



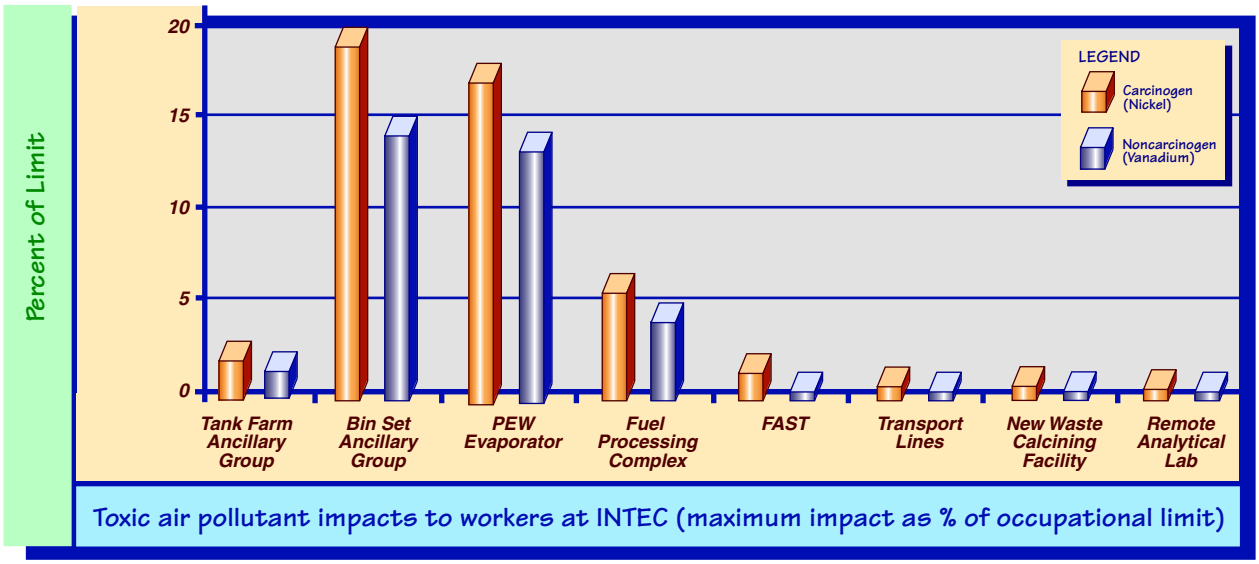


FIGURE 5.3-9.
Comparison of toxic air impacts for disposition of existing INTEC facilities.