

Table B-12. Site Investigations and Monitoring at Waste Management Facilities in the F- and H-Area Geographic Grouping<sup>a</sup>

Facility	RCRA monitoring well <sup>b</sup>	Site investigations <sup>c</sup>	Monitoring results
<b>HAZARDOUS WASTE SITES</b>			
F-Area acid/caustic basin (904-74G)	FAC 1 FAC 2 FAC 3 FAC 4	Wells monitored quarterly for RCRA and SCHWMR parameters. Waste site characterization program completed in 1985.	Statistical analysis of groundwater monitoring data shows the following to be present: <ul style="list-style-type: none"> <li>● pH</li> <li>● Conductivity</li> <li>● Manganese</li> <li>● Sodium</li> <li>● Sulfate</li> <li>● Barium</li> </ul> Sediment samples showed elevated levels of metals and other inorganics.
H-Area acid/caustic basin (904-75G)	None	Waste site characterization program, completed in 1985, consists of water, sediment, and soil sample analysis.	None.
F-Area burning/rubble pits (231-F, 231-1F)	FBP 1A FBP 2A FBP 3A FBP 4	Wells monitored quarterly for RCRA and SCHWMR parameters. Waste site sediment characterization program to be conducted.	Statistical analysis of groundwater monitoring data shows the following to be present: <ul style="list-style-type: none"> <li>● Conductivity</li> <li>● Total organic carbon</li> <li>● Total organic halogen</li> <li>● pH</li> <li>● Sodium</li> <li>● Chloride</li> </ul>
<b>LOW-LEVEL WASTE SITES</b>			
H-Area retention basin (281-3H)	281-3H-11 <sup>d</sup> 281-3H-13 <sup>d</sup>	Core samples of basin sediments taken in 1973. Radiological survey (1977) of soil and vegetation found elevated levels of radioactivity. Wells monitored for tritium, gross alpha, and gross nonvolatile beta.	Soil constituents include: <ul style="list-style-type: none"> <li>● Cesium-137</li> <li>● Strontium-89, -90</li> <li>● Plutonium-238</li> </ul> Radiation measured at 90 mrad/hr. Vegetation exhibited levels of <ul style="list-style-type: none"> <li>● Cesium-137 at 8200-8900 pCi/g</li> <li>● Strontium-89, -90 at 58,000 pCi/g</li> </ul> Groundwater monitoring data shows elevated levels of tritium.
F-Area retention basin (281-3F)	None	In late 1978, 994 m <sup>3</sup> of contaminated soil removed. Core samples taken at that time.	Soil constituents include: <ul style="list-style-type: none"> <li>● Cesium-137</li> <li>● Strontium-89, -90</li> </ul>

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Table B-12. Site Investigations and Monitoring at Waste Management Facilities in the F- and H-Area Geographic Grouping<sup>a</sup> (continued)

Facility	RCRA monitoring well <sup>b</sup>	Site investigations <sup>c</sup>	Monitoring results
LOW-LEVEL WASTE SITES (continued)			
Radioactive waste burial ground (643-7G)	15 wells directly associated with 643-7G <sup>c</sup>	Wells monitored for: <ul style="list-style-type: none"> <li>● Tritium</li> <li>● Gross alpha</li> <li>● Gross nonvolatile beta</li> <li>● Mercury</li> <li>● Lead</li> <li>● Cadmium</li> </ul>	Groundwater constituents include: <ul style="list-style-type: none"> <li>● Gross beta</li> <li>● Tritium</li> <li>● Strontium-90</li> <li>● Technetium-99</li> <li>● Cesium-137</li> <li>● Cobalt-60</li> <li>● Plutonium-238</li> <li>● Curium-244</li> <li>● Mercury</li> <li>● Lead</li> <li>● Cadmium</li> </ul>
MIXED WASTE SITES			
Radioactive waste burial ground (643-G)	125 single wells and 3 well clusters directly associated with 643-G <sup>d</sup>	Groundwater wells monitored for: <ul style="list-style-type: none"> <li>● Tritium</li> <li>● Gross alpha</li> <li>● Gross nonvolatile beta</li> <li>● Mercury</li> <li>● Lead</li> <li>● Cadmium</li> </ul> Following parameters measured for wells with history of gross alpha or gross nonvolatile beta activity <ul style="list-style-type: none"> <li>● Cobalt-60</li> <li>● Strontium-90</li> <li>● Cesium-137</li> <li>● Plutonium-238, -239</li> </ul> Dry boreholes used for in-situ gamma radiation measurements. Additional soil coring planned.	Groundwater constituents include: <ul style="list-style-type: none"> <li>● Gross alpha</li> <li>● Gross beta</li> <li>● Tritium</li> <li>● Mercury</li> <li>● Lead</li> <li>● Cadmium</li> <li>● Strontium-90</li> <li>● Technetium-99</li> <li>● Cesium-137</li> <li>● Cobalt-60</li> <li>● Plutonium-238</li> <li>● Curium-244</li> </ul> Tritium plume defined east of facility.
Mixed waste management facility (643-28G)	38 wells are associated with 643-28G <sup>d</sup>	27 new RCRA monitoring wells located in clusters of 3 will be installed with RCRA monitoring proposed as part of postclosure detection and compliance point monitoring. A compaction study will determine the physical characteristics of the waste and overburden. A borrow study will identify sources of material for the final cover.	The presence of hazardous constituents in the groundwater at the boundary of 643-28G has not been established.

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Table B-12. Site Investigations and Monitoring at Waste Management Facilities in the F- and H-Area Geographic Grouping<sup>a</sup> (continued)

Facility	RCRA monitoring well <sup>b</sup>	Site investigations <sup>c</sup>	Monitoring results
MIXED WASTE SITES (continued)			
F-Area seepage basins (904-41G, 904-42G, 904-43G)	FSB 76, 76A, B, C FSB 77 FSB 78, 78A, B, C FSB 79, 79A, B, C FSB 87A, B, C, D	Wells monitored quarterly for RCRA and SCHWMR parameters. 13 plume-definition wells installed in fall 1984. Soil samples from seepage basin collected during several studies (1971 and 1984). Terrain conductivity survey completed. As of 11/5/87, 28 RCRA compliance wells have been installed.	<p>Statistical analysis of groundwater monitoring data shows the presence of:</p> <ul style="list-style-type: none"> <li>● Conductivity</li> <li>● Total dissolved solids</li> <li>● Turbidity</li> <li>● Sodium</li> <li>● Zinc</li> <li>● Nitrate</li> <li>● pH</li> <li>● Cadmium</li> <li>● Copper</li> <li>● Lead</li> <li>● Mercury</li> <li>● Manganese</li> <li>● Nickel</li> <li>● Gross beta</li> <li>● Radium</li> <li>● Chromium</li> <li>● Fluoride</li> </ul> <p>(Sampling techniques or well construction may bias results.)</p> <p>Additional probable groundwater contaminants include</p> <ul style="list-style-type: none"> <li>● Gross alpha</li> <li>● Tritium</li> <li>● Strontium-90</li> <li>● Selenium</li> <li>● Barium</li> </ul> <p>Probable soil contaminants include</p> <ul style="list-style-type: none"> <li>● Americium-241</li> <li>● Cobalt-60</li> <li>● Cesium-137</li> <li>● Tritium</li> <li>● Iodine-129</li> <li>● Niobium-95</li> <li>● Promethium-147</li> <li>● Ruthenium-106</li> <li>● Strontium-89, -90</li> <li>● Uranium-234, -235, -238</li> <li>● Zirconium-95</li> <li>● Chromium</li> <li>● Sodium</li> <li>● Zinc</li> <li>● Tin</li> <li>● Mercury</li> </ul>

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Table B-12. Site Investigations and Monitoring at Waste Management Facilities in the F- and H-Area Geographic Grouping<sup>a</sup> (continued)

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Facility	RCRA monitoring well <sup>b</sup>	Site investigations <sup>c</sup>	Monitoring results
MIXED WASTE SITES (continued)			
F-Area seepage basin (904-49G)	FNB 1 FNB 2 FNB 3 FNB 4	Wells monitored quarterly for RCRA and SCHWMMR parameters. Sediment samples collected from basin in June 1955. Wastewater samples collected in February 1985.	Statistical analysis of groundwater monitoring data indicates the presence of: <ul style="list-style-type: none"> <li>● Conductivity</li> <li>● Nitrate</li> <li>● pH</li> <li>● Barium</li> <li>● Manganese</li> <li>● Sodium</li> <li>● Gross alpha</li> <li>● Gross beta</li> <li>● Radium</li> <li>● Lead</li> </ul> Constituents present in groundwater include: <ul style="list-style-type: none"> <li>● Mercury</li> <li>● Lead</li> <li>● Total dissolved solids</li> </ul>
H-Area seepage basins (904-44G, 904-45G, 904-46G, 904-56G)	HSB 65, 65A, B, C HSB 66 HSB 67 HSB 68, 68A, B, C HSB 69 HSB 70 HSB 71 HSB 83A, B, C, D HSB 84A, B, C, D HSB 85A, B, C HSB 86A, B, C, D	Wells monitored quarterly for RCRA and SCHWMMR parameters. 21 plume-definition wells installed in fall 1984. 0.9-m cores collected from bottoms of H-Area basins in 1984. Terrain conductivity survey completed. As of 11/5/87, 27 of 42 RCRA compliance wells were installed.	Statistical analysis of groundwater monitoring data indicate the following to be present: <ul style="list-style-type: none"> <li>● pH</li> <li>● Conductivity</li> <li>● Total dissolved solids</li> <li>● Manganese</li> <li>● Sodium</li> <li>● Fluoride</li> <li>● Nitrate</li> <li>● Mercury</li> <li>● Gross beta</li> <li>● Cadmium</li> <li>● Radium</li> <li>● Chloride</li> </ul> Additional constituents present: <ul style="list-style-type: none"> <li>● Gross alpha</li> <li>● Tritium</li> <li>● Strontium-90</li> <li>● Lead</li> <li>● Barium</li> <li>● Antimony</li> </ul>

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Table B-12. Site Investigations and Monitoring at Waste Management Facilities in the F- and H-Area Geographic Grouping<sup>a</sup> (continued)

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Facility	RCRA monitoring well <sup>b</sup>	Site investigations <sup>c</sup>	Monitoring results
MIXED WASTE SITES (continued)			
			Soil column constituents include: <ul style="list-style-type: none"> <li>● Plutonium-238</li> <li>● Plutonium-239, -240</li> <li>● Americium-241</li> <li>● Cerium-144</li> <li>● Curium-244</li> <li>● Cobalt-60</li> <li>● Cesium-134, -137</li> <li>● Tritium</li> <li>● Iodine-129</li> <li>● Promethium-147</li> <li>● Strontium-89, -90</li> <li>● Ruthenium-106</li> <li>● Technetium-99</li> <li>● Uranium-234, -235, -238</li> <li>● Zirconium-95</li> <li>● Barium</li> <li>● Chromium</li> <li>● Sodium</li> <li>● Lead</li> <li>● Zinc</li> <li>● Mercury</li> </ul>

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<sup>a</sup>Sources: Ward, Johnson, and Marine, 1987; Huber, Johnson, and Marine, 1987; Scott, Killian, Kolb, Corbo, and Marine, 1987; Jaegge et al., 1987; DOE, 1985; Killian et al, 1987a,b; Du Pont, 1985b; Odum et al., 1987.

<sup>b</sup>Monitored hydrogeologic units for these wells are the Barnwell and McBean.

<sup>c</sup>See page B-1.

<sup>d</sup>Not RCRA monitoring wells.

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