Select Ash- and Scrubber Sludge-Related Toxic Metal Discharges from TVA Power Plants[1]

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH FROM FISH CONSUMPTION	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Allen (Shelby County, TN)	McKellar Lake	Oct. 2004	Aluminum (001)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**1,500**
Allen	McKellar Lake	Oct. 2004	Arsenic (001)		0.14	TN Domestic Use: 10; Consumption of Organisms: 10	**N/A**	**43**
Allen	McKellar Lake	Oct. 2004	Selenium (001)	Freshwater Chronic: 5		TN Fish & Aquatic Chronic: 5; Acute 20	**N/A**	**38**
Cumberland (Stewart County, TN)	Cumberland River	May 2005	Aluminum (001)	Freshwater Chronic: 87		-	**N/A**	**320**
Cumberland	Cumberland River	May 2005	Manganese (001)		100	-	**N/A**	**520**
Cumberland	Cumberland River	May 2005	Arsenic (001)		0.14	-	**N/A**	**3**
Cumberland	Cumberland River	May 2005	Selenium (001)	Freshwater Chronic: 5		TN Fish & Aquatic Chronic: 5; Freshwater Acute: 20	**N/A**	**130**

Select Ash- and Scrubber Sludge-Related Toxic Metal Discharges from TVA Power Plants[1]

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH (FISH CONSUMPTION)	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Gallatin (Sumner County, TN)	Cumberland River	May 2004	Aluminum (001)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**1,700**
Gallatin	Cumberland River	May 2004	Arsenic (001)		0.14	TN Domestic Use: 10; Consumption of Organisms: 10	**18**	**34**
Gallatin	Cumberland River	May 2004	Selenium (001)	Freshwater Chronic: 5		TN Fish & Aquatic Chronic: 5	**26**	**40**
Johnsonville (Humphreys County, TN)	Tennessee River	May 2003	Aluminum (001)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**1,640**	**3,400**
Johnsonville	Tennessee River	May 2003	Antimony (001)			TN Domestic Use: 6	**N/A**	**7.6**
Johnsonville	Tennessee River	May 2003	Arsenic (001)	Freshwater Chronic: 150	0.14	TN Domestic Use: 10; Consumption of Organisms: 10; Fish & Aquatic Chronic: 150	**153**	**243**
Johnsonville	Tennessee River	May 2003	Selenium (001)	Freshwater Chronic: 5		TN Fish & Aquatic Chronic: 5	**N/A**	**7.3**

Select Ash- and Scrubber Sludge-Related Toxic Metal Discharges from TVA Power Plants[1]

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH (FISH CONSUMPTION)	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Kingston (Roane County, TN)	Clinch River	Dec. 2002	Aluminum (001)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**990**
Kingston	Clinch River	Dec. 2002	Antimony (001)			TN Domestic Use: 6	**N/A**	**7.3**
Kingston	Clinch River	Dec. 2002	Arsenic (001)		0.14	TN Domestic Use: 10; Consumption of Organisms: 10	**N/A**	**90**
Kingston	Clinch River	Dec. 2002	Selenium (001)	Freshwater Chronic: 5		TN Fish & Aquatic Chronic: 5; Acute 20	**N/A**	**24**
Kingston	Clinch River	Dec. 2002	Aluminum (007)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**1300[4]**
Kingston	Clinch River	Dec. 2002	Iron (007)	Freshwater Chronic: 1000		-	**N/A**	**55,000**
Kingston	Clinch River	Dec. 2002	Manganese (007)		100	-	**N/A**	**2,400**
Kingston	Clinch River	Dec. 2002	Arsenic (007)		0.14	TN Domestic Use: 10; Consumption of Organisms: 10	**N/A**	**31**

Select Ash- and Scrubber Sludge-Related Toxic Metal Discharges from TVA Power Plants[1]

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH (FISH CONSUMPTION)	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Widows Creek (Jackson County, AL)	N/A[5]	Sept. 2007[5]	Aluminum[5]	Freshwater Acute: 750; Freshwater Chronic: 87			**N/A**	**1,070[6]**
Widows Creek	N/A[5]	Sept. 2007[5]	Arsenic[5]		0.14	AL WQC for Consumption of Fish: 0.303	**N/A**	**30.1 - 29.0[7]**
Widows Creek	N/A[5]	Sept. 2007[5]	Chromium (VI)[2] [5]	Freshwater Chronic: 11		AL Freshwater Chronic: 11	**N/A**	**12 - 14.7[7]**
Widows Creek	N/A[5]	Sept. 2007[5]	Selenium[5]	Freshwater Chronic: 5		AL Freshwater Chronic: 5	**N/A**	**16.2 - 17.1[7]**
Widows Creek	N/A[5]	Sept. 2007[5]	Thallium[5]		0.47	AL WQC for Consumption of Fish: 0.0273	**N/A**	**1.46**
Widows Creek	Tennessee River	Apr. 2004	Aluminum (001)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**1,200[8]**
Widows Creek	Tennessee River	Apr. 2004	Iron (001)	Freshwater Chronic: 1000		-	**650**	**1,800**
Widows Creek	Tennessee River	Apr. 2004	Arsenic (001)		0.14	AL WQC for Consumption of Fish: 0.303	**36**	**55**
Widows Creek	Tennessee River	Apr. 2004	Selenium (001)	Freshwater Chronic: 5		AL Freshwater Chronic: 5	**N/A**	**19**
Widows Creek	Tennessee River	Apr. 2004	Aluminum (005)	Freshwater Acute: 750; Freshwater Chronic: 87		-	**N/A**	**2,600**

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH (FISH CONSUMPTION)	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Widows Creek	Tennessee River	Apr. 2004	Iron (005)	Freshwater Chronic: 1000		-	**N/A**	**1,300**
Widows Creek	Tennessee River	Apr. 2004	Manganese (005)		100	-	**2,200**	**2,500**
Widows Creek	Widows Creek	Apr. 2004	Iron (007)	Freshwater Chronic: 1000		-	**N/A**	**1,400**
Widows Creek	Widows Creek	Apr. 2004	Arsenic (007)		0.14	AL WQC for Consumption of Fish: 0.303	**N/A**	**4**
Widows Creek	Tennessee River	Apr. 2004	Aluminum (008)	Freshwater Chronic: 87		-	**N/A**	**480**
Widows Creek	Tennessee River	Apr. 2004	Manganese (008)		100	-	**N/A**	**2,300**
Widows Creek	Tennessee River	Apr. 2004	Arsenic (008)		0.14	AL WQC for Consumption of Fish: 0.303	**N/A**	**19**
Widows Creek	Tennessee River	Apr. 2004	Selenium (008)	Freshwater Chronic: 5		AL Freshwater Chronic: 5; Freshwater Acute: 20	**N/A**	**131**
Widows Creek	Tennessee River	Apr. 2004	Iron (006)	Freshwater Chronic: 1000		-	**N/A**	**1,300**
Widows Creek	Tennessee River	Apr. 2004	Manganese (006)		100	-	**2,200**	**4,300**

TVA FACILITY	RECEIVING WATER	DATE OF PERMIT APPLICA-TION	POLLUTANT (Outfall)	WATER QUALITY CRITERIA (WQC) (µg/L)			REPORTED DISCHARGE	
				USEPA RECOMMENDED WQC FOR AQUATIC LIFE	USEPA RECOMMENDED WQC FOR HUMAN HEALTH (FISH CONSUMPTION)	APPLICABLE STATE WQC	LONG TERM AVERAGE (µg/L)	MAXIMUM DAILY (µg/L)[2] [3]
Widows Creek	Widows Creek	Apr. 2004	Manganese (013)		100	-	**N/A**	**1,300**
Widows Creek	Widows Creek	Apr. 2004	Aluminum (013)	Freshwater Chronic: 87		-	**N/A**	**130**

1	Unless otherwise indicated (see note 5), all data are from NPDES permit applications submitted to USEPA.
2	USEPA requires levels for arsenic and chromium (VI) to be expressed in terms of dissolved metals. See USEPA, National Recommended Water Quality Criteria, Appendix A - Conversion Factors for Dissolved Metals, http://www.epa.gov/waterscience/criteria/wqctable/index.html#appendxa. For arsenic, although the data provided total recoverable instead of total dissolved metals, the conversion factor to dissolved metals is one (1), so numbers represent dissolved levels.
3	We have not yet reviewed discharge data for exceedances of hardness-dependant metals, namely cadmium, chromium (III), copper, lead, nickel, silver, or zinc.
4	This reading may be more toxic than normal as the pH for this reading was between 5.9 and 6.5 whereas USEPA's limit assumes a pH for aluminum of 6.5 to 9.0. USEPA provides that "aluminum is substantially less toxic at higher pH," so this lower pH may mean the reading is even more toxic. See USEPA, National Recommended Water Quality Criteria, Non-Priority Pollutants, footnote L.
5	This data was obtained from USEPA, Final Sampling Episode Report, Tennesee Valley Authority's Widows Creek Fossil Plant Stevenson, AL, Episode 6549, Aug. 26, 2008. The study did not state whether these samples were associated with a specific outfall number or receiving water.
6	This reading may be more or less toxic than normal as the pH for this reading is unknown. See note 4, supra.
7	The range of numbers reflects readings conducted for Routine Metals and Low Level Metals.
8	This reading may be less toxic than normal as the pH for this reading was between 7.0 and 9.4 whereas USEPA's limit assumes a pH for aluminum of 6.5 to 9.0. See note 4, supra.