

Table 21. Metal concentrations of residuals (mg/kg).

	503 Pollutant Concentration	Clayton Co. (In Vessel) Composting	Glynn County Composting	Clayton Co. Pelletizing	Cobb Co. Incineration	DeKalb Co. Land Ap.	Cobb Co. Landfilling
Arsenic	41	7.23	1.36	2.06	0.115	<2	5.90
Cadmium	39	1.70	0.56	2.46	0.005	3.00	1.96
Chromium	1200		9.40	31.70	0.005	15.66	62.60
Copper	1500	72.70	53.30	235.00		176.00	134.34
Lead	300	7.07		48.90	0.010	14.00	14.56
Mercury	17	0.54	0.02	1.15	0.001	<1	3.28
Molybdenum*	18	6.70	1.77	5.79		10.00	
Nickel	420	3.90		26.70		9.00	29.98
Selenium	36	6.17	0.99	1.65	0.033	<2	7.87
Zinc	2800	125.00	148.00	1049.00		423.22	337.22

* EPA has suspended the Molybdenum pollutant concentration limit

6.0 EMERGING TECHNOLOGIES

The need for alternative methods of disposal is the driving force behind innovative research and exploration. Many new ideas and technologies that can utilize biosolids in productive ways are being explored. Emerging technologies, or those sludge disposal technologies still in the developmental stage, typically have been tried only on a small scale or laboratory bench. Emerging technologies include animal feed production, biobrick production, cement from sludge, earthworm conversion (vermiculture), fuel from sludge, and road aggregate production. The American Society of Civil Engineers and the Water Environment Federation, with grant assistance from the U.S. Environmental Protection Agency, have published a reference book, Design of Municipal Wastewater Treatment Plants, that contains a thorough discussion on these subjects.

7.0 GEORGIA BIOSOLIDS DATA

A significant amount of data was obtained through the Environmental Protection Division (Georgia Department of Natural Resources) concerning the permitting and biosolids inventoried throughout the state of Georgia. The most recent completed database of facilities and disposal figures uses 1997 data. Though the actual amount of waste being produced may vary, the general picture of the state's biosolids production is well represented in this database.

As was previously stated, this report specifically is concerned with the National Pollutant Discharge Elimination System (NPDES) permitted publicly owned treatment works (POTW) that produce waste products classified as sludge or biosolids. The EPD databases contain information for each facility on the type of disposal methods used (i.e. composting, incineration, landfilling, land application, pelletizing) and dry weight of biosolids removed per day. One gap in the information concerning the total amount of biosolids produced in Georgia is due to the fact that many facilities use simple pond systems where sludge removal is seldom if ever performed. In a well-managed pond/lagoon system, the sludge is degraded and never leaves the system. But in the pond systems where sludge removal does occur, the amount and method of disposal are not quantified within these databases.



Figure 5. Georgia's regional development centers

There are 159 counties in Georgia, and reporting of biosolids generation on an individual county basis would present a disjointed view of the state. It is the goal of this report to provide biosolids information to the entire state, therefore using regions which already have a structured authority in waste management policies is highly desirable. This report uses the sixteen Regional Development Centers (RDC) presently established for reporting data. Figure 5 shows the RDC regions and Table 22 shows the counties in each region.

Table 22. List of counties in each Regional Development Center in Georgia.

Atlanta Regional Commission	Central Savannah River Area	Chatta- hoochee Flint	Coastal Georgia	Coosa Valley	Georgia Mountains	Heart of Georgia Altamaha	Lower Chattahoochee Flint
Cherokee	Burke	Carroll	Bryan	Bartow	Banks	Appling	Chattahoochee
Clayton	Columbia	Coweta	Bulloch	Catoosa	Dawson	Bleckley	Clay
Cobb	Emanuel	Heard	Camden	Chattooga	Forsyth	Candler	Harris
Dekalb	Glascok	Meriwether	Chatham	Dade	Franklin	Dodge	Muscogee
Douglas	Hancock	Troup	Effingham	Floyd	Habersham	Evans	Quitman
Fayette	Jefferson		Glynn	Gordon	Hall	Jeff Davis	Stewart
Fulton	Jenkins		Liberty	Haralson	Hart	Laurens	Randolph
Gwinnett	Johnson		Long	Paulding	Lumpkin	Montgomery	Talbot
Henry	Lincoln		McIntosh	Polk	Rabun	Tattnall	
Rockdale	McDuffie			Walker	Stephens	Telfair	
	Richmond				Towns	Toombs	
	Screven				Union	Treutlen	
	Taliaferro				White	Wayne	
	Warren					Wheeler	
	Washington					Wilcox	
	Wilkes						
McIntosh Trail	Middle Flint	Middle Georgia	North Georgia	Northeast Georgia	South Georgia	Southeast Georgia	Southwest Georgia
Butts	Crisp	Baldwin	Fannin	Barrow	Ben Hill	Atkinson	Baker
Lamar	Dooly	Bibb	Gilmer	Clarke	Berrien	Bacon	Calhoun
Pike	Macon	Crawford	Murray	Elbert	Brooks	Brantley	Colquite
Spalding	Marion	Houston	Pickens	Greene	Cook	Charlton	Dougherty
Upton	Schley	Jones	Whitfield	Jackson	Echols	Clinch	Decatur
	Sumter	Monroe		Jasper	Irwin	Coffee	Early
	Taylor	Peach		Madison	Lanier	Pierce	Grady
	Webster	Pulaski		Morgan	Lowndes	Ware	Lee
		Putnam		Newton	Tift		Miller
		Twiggs		Oconee	Turner		Mitchell
		Wilkinson		Oglethorpe			Seminole
				Walton			Terrell
							Thomas
							Worth