Technical Bulletin
Media Disposal and Backwashing

Technical Bulletin 2003-01 (rev 10/06)
AdEdge Technologies, Inc.

Subject: Disposal and Backwashing Guidance - Arsenic Adsorption Media (Bayoxide E33®)

Q: How is the spent media disposed once it has been exhausted?

A: One of the key advantages of AdEdge's E33 granular ferric oxide adsorbent is its ability to strongly bind arsenic as water passes through the media through a combination of adsorption, adhesion, and other physical/chemical mechanisms. The iron oxide based E33 product has been used in many pilot and commercial applications in the US and UK since 1999. AdEdge and its partner Severn Trent Services (as well as third party testing organizations) have tested spent Bayoxide E33 media from arsenic adsorption applications on various sites. In every case, the spent adsorption media easily passed the USEPA's Toxic Characteristic Leaching Procedure threshold (TCLP per RCRA 40 CFR 261). The TCLP test is an extraction procedure used for determining whether the material (media), when discarded, would classify as a hazardous waste. Results are consistently well below the threshold levels.

Based on repeated results, AdEdge has demonstrated that the spent media will not be a characteristically hazardous waste. Unless preempted by more stringent state or local regulations, the spent media is considered a RCRA Subtitle D, nonhazardous solid waste, suitable for disposal in a sanitary landfill. The table below shows some spent media testing results:

Metal	Toxicity Characteristic Leaching Procedure (mg/L)		
	Col #1	Col #2	Limit
Arsenic (TCLP)	< 0.01	< 0.20	5.0
Barium (TCLP)	0.08	0.24	100
Cadmium (TCLP)	< 0.10	< 0.10	1.0
Chromium (TCLP)	< 0.01	< 0.20	5.0
Lead (TCLP)	< 0.20	< 0.20	5.0
Mercury (TCLP)	< 0.02	< 0.02	0.2
Selenium (TCLP)	< 0.01	< 0.01	1.0
Silver (TCLP)	< 0.10	< 0.10	5.0

Ref: Spent media from pilot site in NM, 2002; influent 90 ppb

Final disposition and determination is typically the responsibility of the customer, since State or U.S. federal agencies do not grant blanket "approval" or "disapproval" of spent materials, but rather allows the generator of such residuals to make a hazardous waste determination. For further guidance on testing the spent media, feel free to contact AdEdge for assistance.

Q: Is Backwashing of the media required? How much water is generated? Does the backwashing step release arsenic to the water?

A: Periodic backwashing is typically performed at startup and every 4-6 weeks thereafter depending on usage and water quality. It is performed for two reasons. All media over time can compact and potentially develop preferential channels that can cause short-circuiting or incomplete adsorption. Additionally, sediment or suspended solids (if present) may be retained (filtered) in the adsorption media bed. To prevent excessive pressure drop or channeling, backwashing (using either feed or treated water) is performed periodically to lift or fluff the bed. Backwashing is typically performed at a rate of 9-10 gpm / square foot for 12-15 minutes. *Arsenic is not desorbed or released during the backwashing process*. In fact, if the feed water is used (which is common), the backwash water is partially treated through the bed and soluble arsenic in the stream is very low, typically less than or nearly the same as influent levels. This low concentration allows the backwash water to be either: (1) discharged to a sewer or POTW (if available); (2) direct discharged following filtration to an open drainage ditch or other location; or (3) recycled back into the feed stream (see AdEdge for details). For direct discharges or recycle, the particulates are typically removed with an appropriately sized bag or cartridge filter prior to discharge or recycle.