ADEDGE ARSENIC TREATMENT SYSTEMS – BACKWASHING

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

A: Periodic backwashing or "fluffing" of the media is performed at startup and every 4-6 weeks thereafter depending on usage and water quality. It is performed for two reasons. All media in pressurized systems over time can compact and potentially develop preferential channels that can cause short-circuiting or incomplete adsorption. Additionally, sediment from the well, (if present), oxidized iron precipitant from the feed water, or other suspended material may be retained and captured in the adsorption media bed. To prevent excessive pressure drop or channeling, backwashing (using typically feed water) to lift or fluff the bed is performed periodically.

Backwashing is typically performed at a rate of 8-10 gpm / square foot for 5-7 bed volumes or about 15 minutes. No chemicals are used. *Arsenic is not desorbed from the media during the backwashing process*. Since the feed water is used for backwashing, the backwash water quality will bear similar characteristics to the feed water. The Table below is an analysis of various parameters from actual field adsorption tests. As noted, some filterable iron particulates (small media particles or captured iron ferric hydroxide [$Fe(OH)_3$] particulates in the influent) are present in the backwash water. This iron particulate represents nearly all of the total suspended solids and can are easily removed with conventional particle filtration. Since the feed water is used for backwashing, some arsenic reduction (partial treatment) results as the water flows upward through the fluidized bed during the backwash process. As observed below, the arsenic levels are in nearly all cases lower than the feed water. Also, it should be noted that a portion of the arsenic in the backwash effluent is associated with the iron particulate and is therefore insoluble and filterable.

SORB 33™ As Removal Pilot Programs
Bayoxide E/AD33 Granular Ferric Oxide Media
Analysis of Media Backwash Effluent Water

Backwash-Assay:27 Aug 03

	Sample	Analysis - Raw Water			Analysis - Backwash Effluent		
Pilot Site	**Date**	**TSS** (PPM)	**As** (PPB)	**Fe** (PPB)	**TSS** (PPM)	**As** (PPB)	**Fe** (PPB)
Rio Rancho, NM	Jan 02	ND	49	50	40	6	29,000
	Apr 02				28	21	18,000
	Apr 02				10	34	180
Manteca, CA	May 02	ND	19	ND	12	8	1,700
	Jul 02				ND	19	380
	Sep 02				ND	20	ND
Fernley, NV	May 03	ND	51	80	<5	18	1,300

Based on the backwash waster quality observed, this water is suitable for (1) discharge to a sewer or POTW (if available); (2) direct discharge following particle filtration to a septic system, an open drainage ditch, or other location; or (3) filtered and recycled back into the feed stream at the head of the system (see AdEdge for details on this option). For direct discharges or recycle scenarios, the backwash water is easily filtered to remove particulates with an appropriately sized dual bag or cartridge filter prior to discharge or recycle. Local or state permitting requirements for direct discharges should be consulted before exercising this option to obtain any regulatory approvals.

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