10/1/74

Bill Engman

The effluent limitation for PCB's from a facility discharging into a stream with a low flow greater than 10 cubic feet per second (cfs) will not exceed

0.0000648 time the receiving water body flow in cfs to give pounds/day

with a maximum discharge limited to 0.0648 #/day

Therefore the minimum flow that can be present in the calculation is 10,000 cfs.

Although the Mississippi river flows at 180,000 cfs average we at WGK at present can't take advantage of the large flow, and we are limited to 10,000 cfs which equates to the 0.0648 #/day max.

However, many of our customers discharge into streams far below the 10,000 cfs flow permitted in the calculation. The maximum PCB's permitted to be discharged relate to the flow as follows:

10,000 cfs	= 0.0648 # PCB/day
5000	0.0324
1000	0.00648
100	0.000648
10	0.0000648

DSW 353305

Therefore our customers (as well as WGK) must reduce the contaminated stream to as low as volume as possible and then must clean-up this stream to a degree necessary to meet the above maximum values based on the flows of the stream into which the plant discharges.

That's what polyurethane foam clean-up is all about. The following table can be used to determine to what volume one must reduce the contaminated

stream and the degree of clean-up required.

Receiving stream → / Contaminated flow (volume GPM) ↓	10,000	5,000	1,000	100	10
	ppb PCB permitted in plant contaminated stream				
10	540	270	54	5.4	0.54
50	108	54	10.8	1.08	0.108
100	54	27	5.4	0.54	0.054
200	27	13.5	2.7	0.27	0.027
500	11	5.5	1.1	0.11	0.011

For instance:

We at WGK can meet guideline. All we have to do is satisfy the PCB in column one at the respective flow volume. Carbon clean-up should get us to 10 ppb. WGK does not need polyurethane foam.

At plant where flow of receiving stream is 5000 cfs can also use carbon for clean-up if contaminated flow is reduced below 3316 GPM (interpolated for above table)

DSW 353306

From plant discharging into 1000 cfs the contaminated flow must be reduced to about 57 GPM (interpolated) to remain with a carbon clean-up at 10 ppb.

A plant cannot use carbon if discharging into only a 100 cfs receiving stream.

I believe we must know minimum value possible with polyurethane foam clean-up. THEN ECONOMIC CONSIDERATIONS OF CARBON VS FOAM must be analyzed. Include regeneration vs throw away for both carbon and foam.

EA

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10,000 mm

Mitchell mass calculation

.00000648 X (cfs)

= 10 cfs no discharge

10 ft³/sec X 60 sec/min X 7.481 gal/ft³ = 4489 gpm

.00000648 X 10,000 cfs = 0.0648 #/day
" 1,000 = 0.00648
100 = 0.000648
10 = 0.0000648

@ 1 GPM X 8.34 #/gal X 1440 min/day = 12,009.6 #/day
@ 100 GPM = 1,200,960 #/day

$\frac{.0648 \text{ \#/day}}{1,200,960} = \frac{x}{10^9}$ $x = \frac{6.48 \times 10^{-2} \times 1 \times 10^9}{1.20096 \times 10^6} = 54$ ppb

@ 200 GPM = 27
@ 10 GPM = 540
@ 50 GPM = 108
@ 500 GPM = 11

	@ 10,000 cfs	5000	@ 1000 cfs	@ 100 cfs	@ 10 cfs
10	540 ppb	270	54	5.4	0.54
50	108	54	10.8	1.08	0.108
100	54	27	5.4	0.54	0.054
200	27	13.5	2.7	0.27	0.027
500	11	55	1.1	0.11	0.011

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