

Site Name Former Grant Hardware
 Date 1/9/2002
 Client Geovation Consultants
 Technicians MB, CL

Weather Rain
 Temp 35 - F
 Blower Info 2-hp regenerative
 Test Well 2" screened 5-15'

Elapsed Time	Vac Test Well (in. H2O)	Flow Test Well (fm)	CFM	Vac 5' (in. H2O)	Vac 10' (in. H2O)	Vac 15' (in. H2O)	Effluent PID (ppm)	Sample ID
0	40	2650	57.78	0.0	0	0	271	
5	40	2650	57.78	0.0	0	0	281	
10	40	2550	55.60	0.0	0	0	274	
15	40	2250	49.06	3.0	0.3	0	283	
25	40	1850	40.34	3.0	0.3	0	279	
30	40	2000	43.61	3.0	0.3	0	277	
45	40	2000	43.61	3.0	0.3	0	280	
50	62	2000	43.61	4.0	0.3	0	911	
60	65	1750	38.16	4.0	0.4	0	758	1
90	65	2350	51.24	4.0	0.4	0	728	
105	65	2450	53.42	4.0	0.35	0.1	1589	
135	65	2650	57.78	4.0	0.45	0.1	842	
165	63	3250	70.87	4.0	0.4	0.15	848	
180	63	1950	42.52	4.0	0.4	0.1	890	
210	63	1650	35.98	4.0	0.45	0.1	865	2

Bleed valve open 1/2.

Closed bleed valve.

Assumptions for Calculations:

Total air flow rate from 4 extraction wells: 200 scfm
 Air flow rate per extraction well: 50 scfm
 Air flow rate in each of the two PVC headers: 112 scfm

Piping run for longest distance to blower:

2 inch PVC pipe + fittings @ 50 scfm

Pipe area = 0.022 ft²

Velocity= 2293 ft/min

	<u>No.</u>	<u>Equiv. Length</u>
2 inch PVC pipe:	NA	18.0 ft
2 inch 90's:	1	5.0
2 in to 4 in adapter:	1	0.5
2 inch gate valve:		1.0
2 inch air flow/pressure gauge port		0.5
		<hr style="width: 100px; margin: 0 auto;"/> 25.0

Friction loss = 0.05 in. water per ft of tubing (see attached chart)

Loss =	1.25 in. water
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4 inch PVC pipe + fittings @ 112 cfm (one of the two headers)

Pipe area = 0.087 ft²

Velocity= 1284 ft/min

	<u>No.</u>	<u>Equiv. Length</u>
4 inch PVC-single header (112 scfm):	NA	142 ft
4 inch 90s in single header:	3	30
2 inch 45's in GAC train (112 scfm)	4	20
2 inch valves in GAC train (112 scfm)	1	1
4 inch 45:	1	5
		<hr style="width: 100px; margin: 0 auto;"/> 198

Friction Loss= 0.01 in. water per ft of tubing (see attached chart)

Loss=	1.98 in. water
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4 inch PVC pipe + fittings @ 200 cfm (in treatment trailer)

Pipe area = 0.087 ft²

Velocity= 2293 ft/min

	<u>No.</u>	<u>Equiv. Length</u>	<u>In. Water</u>
4 inch PVC:	NA	142 ft	
4 inch 90s:	12	120	
4 inch valves:	1	<u>1</u>	
		263	
Moisture Separator	1	NA	1.0
Air filters/blower silencer			1.0
GAC units - 2 in series @ 200 cfm each (1 train)			2.6

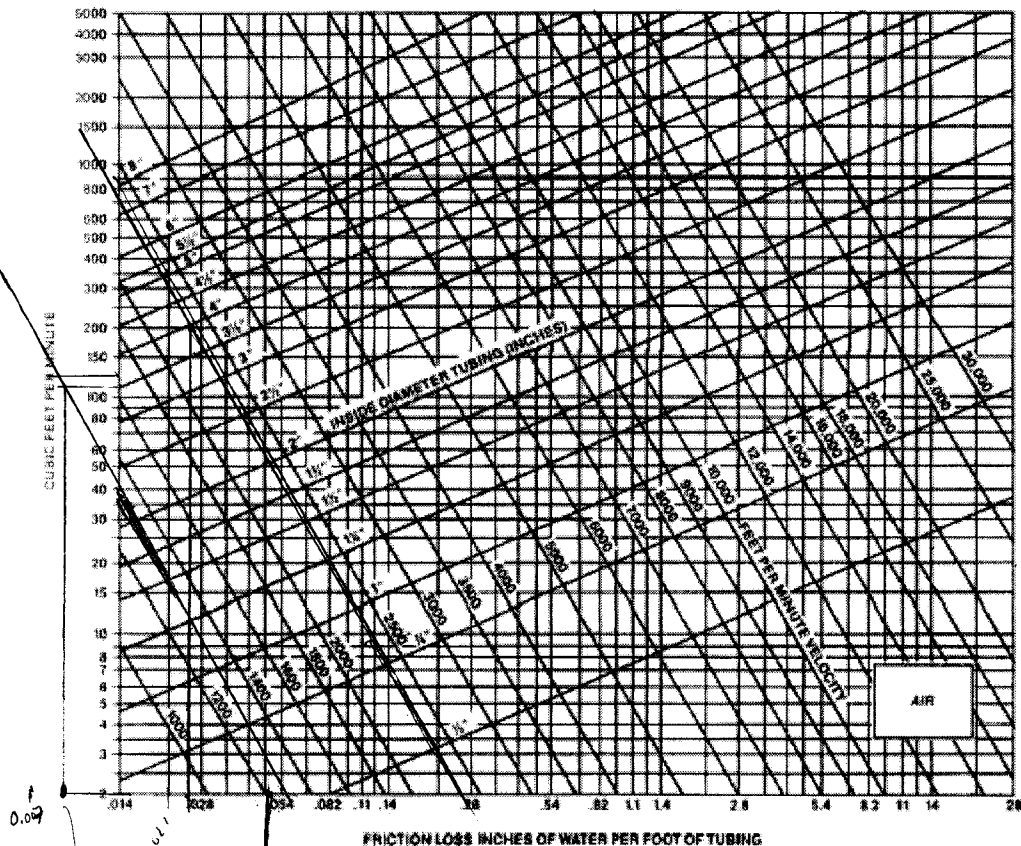
Friction Loss= 0.026 in. water per ft of tubing (see attached chart)

Loss=	11.44 in. water
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Total Estimated Friction Loss: 15 inches water

Vacuum to be supplied (based on pilot): 63 inches water

Estimated Total Vacuum Required: 78 inches water



0.04
 0.011
 SA, 0.012

$$\frac{0.0067}{4 \times 3} = 0.0192$$

$$\frac{0.011}{0.22} = 0.05$$

$$9 \sqrt{\frac{0.026}{2.1}}$$