PREMIER PLASTICS INC.

GENERAL EFFECTS OF TRANSPORT PIPE SIZE

1. A smaller diameter pipe (2”) will fully flood more quickly resulting in full benefit of the vertical head in driving the flow to the field.

2. A medium diameter pipe (3”) may cause the air and effluent to remain in a turbulent interaction as equally opposing forces throughout the cycle. The flow may oscillate between fully flooded and channel flow in different sections of the pipe. This scenario may result in the most potential aeration of the effluent but squirt height will be limited. Venting the transport line near the top of the slope will expel the trapped air and result in a greater squirt height.

3. A large diameter pipe (4”) will result in more stable flow - meaning channel flow (non-flooded) at the top end of the transport pipe, and fully flooded flow at the lower section which would produce the driving head into the field. There is no head benefit from non-flooded sections of pipe.

4. A combination of a larger pipe diameter at the top end of the transport pipe, and smaller pipe diameter at the lower end will ensure that the required residual head for the desired squirt height is achieved. What may be deemed as too much squirt height in a system with a large vertical drop can be managed by ensuring the flow in the upper section of the transport pipe is running in channel mode with stable separation of effluent and air, thus limiting the buildup of residual head at the field.

5. The maximum potential flow rate (i.e. no trapped air) was determined by pre-flooding the transport pipe prior to starting the cycle. Comparing these results with the normal cycle indicates the degree of influence of air in the transport pipe. (see Tables.)

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