

**FILTER MEDIA PROCESSING
FOR
WATER & WASTEWATER TREATMENT**

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**DELMON CO. LTD
SAWEA WORKSHOP
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OUTLINE

- ◆ **Definitions of Filter Media and Filtration**
- ◆ **Filtration Spectrum**
- ◆ **Pressure and Gravity Filtration**
- ◆ **Filter Media Selection**
- ◆ **Delmon Co Ltd Process Flow Diagram**
- ◆ **Laboratory testing of filter media**
- ◆ **Pilot plant testing of filter media**
- ◆ **Conclusions**

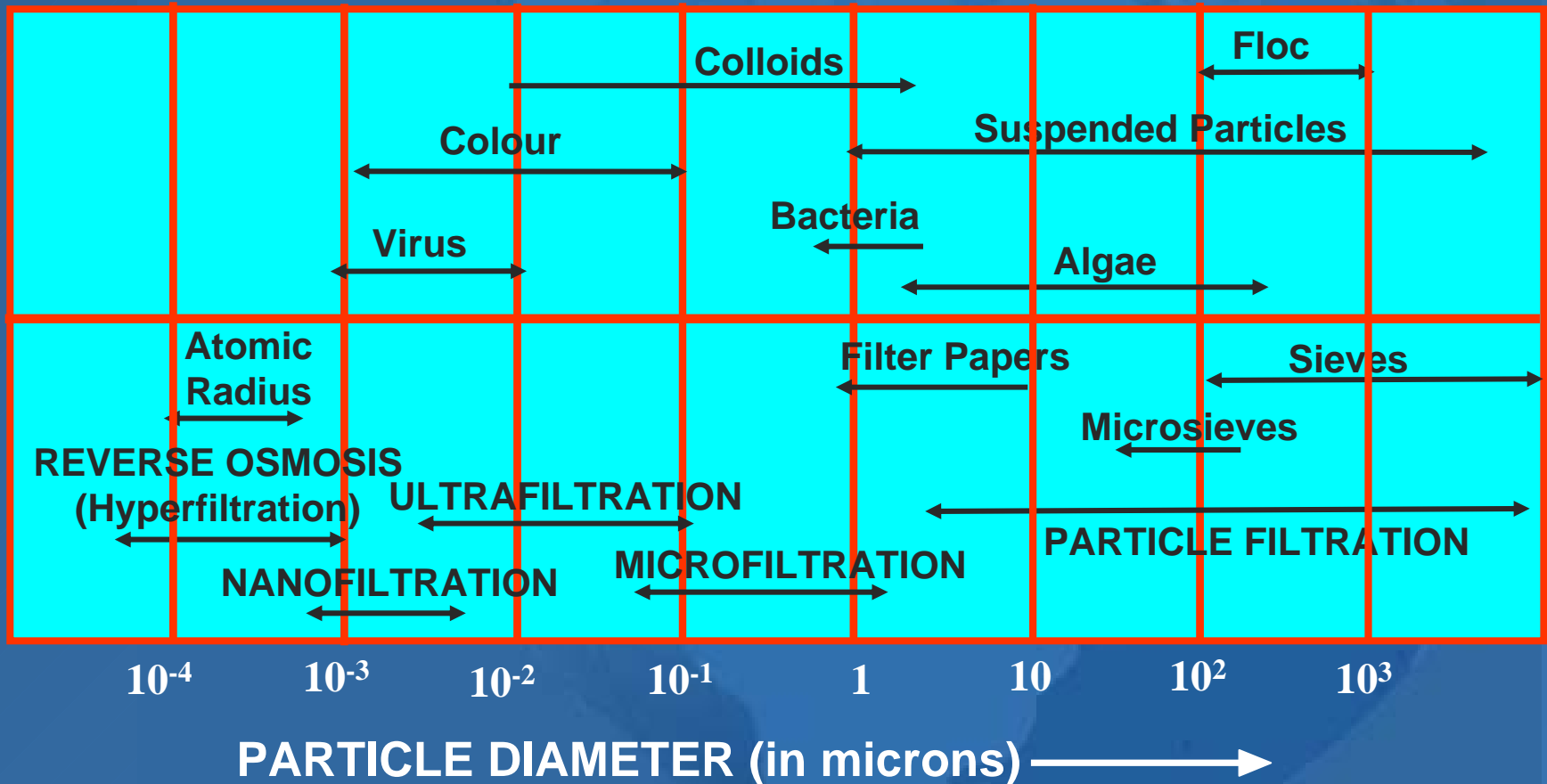
DEFINITION OF FILTER MEDIA

Filter media are the granular filtering materials which are installed in the filters. Their function is to retain the suspended solids during the filtration process.

FILTRATION DEFINITION

Filtration is defined as the passage of a fluid through a porous medium (or media) in order to remove matter held in suspension

SIZE COMPARISON OF WATERBORNE PARTICLES AND FILTER PORES (FILTRATION SPECTRUM)

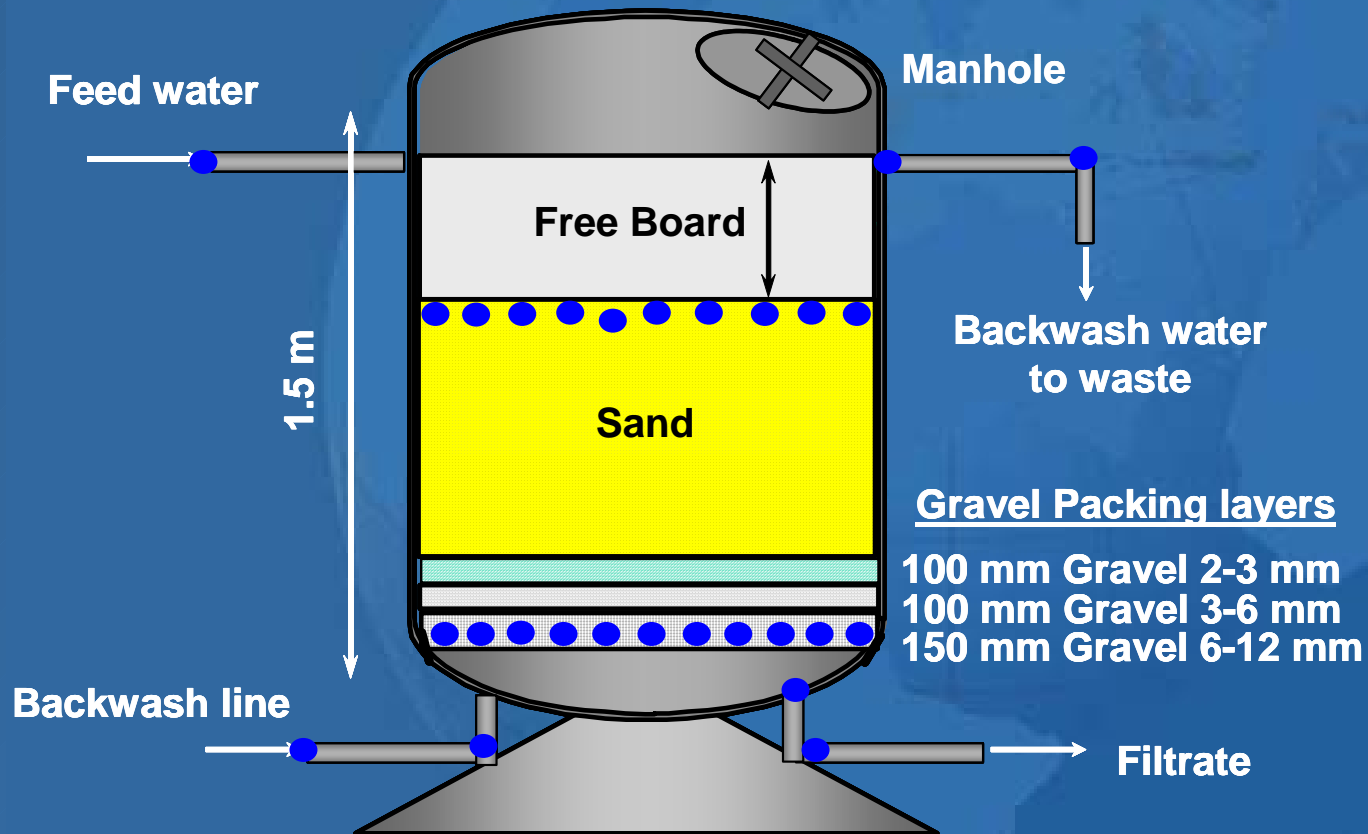


FILTER MEDIA/FILTRATION PROCESSES

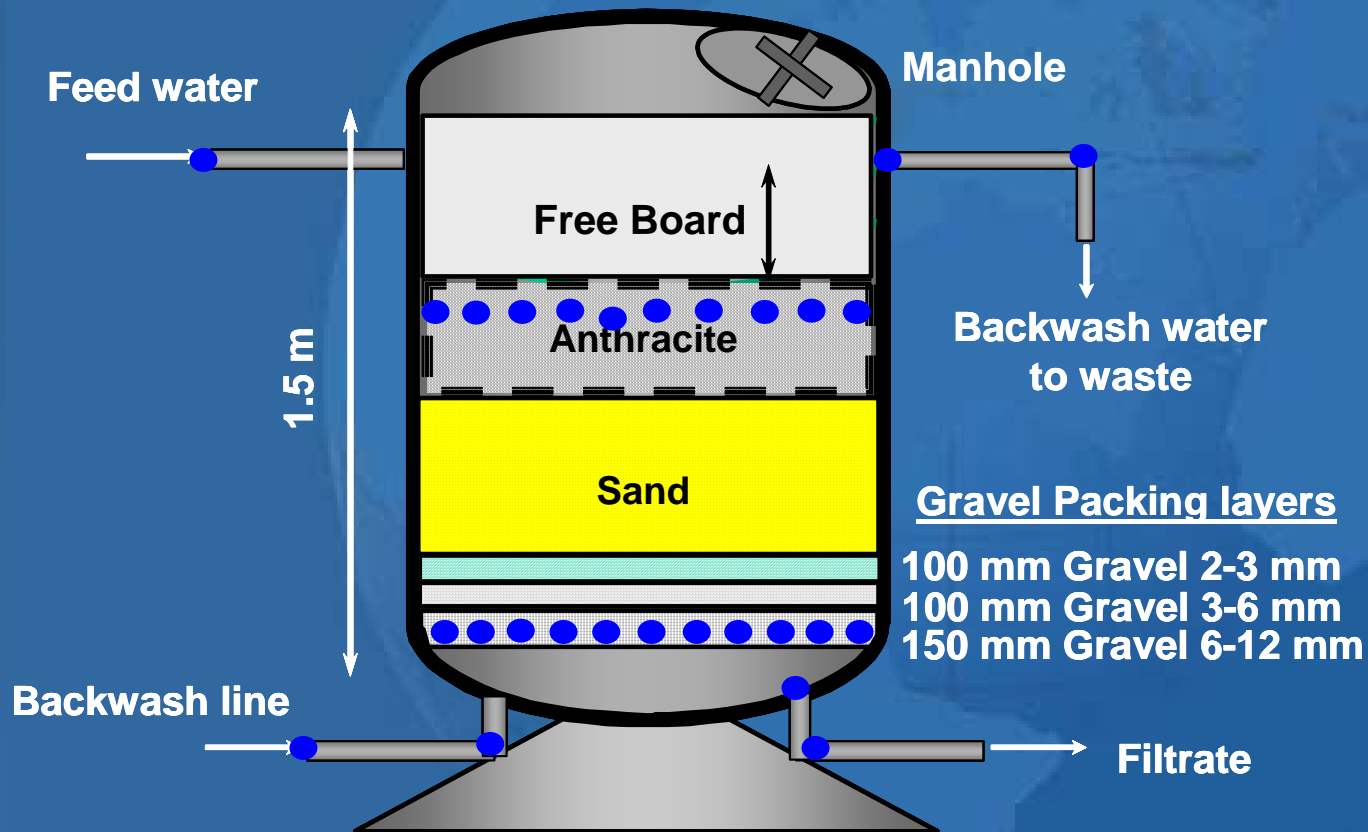
Pressure and Gravity Filtration



VERTICAL TYPE PRESSURE FILTER (SINGLE MEDIUM)



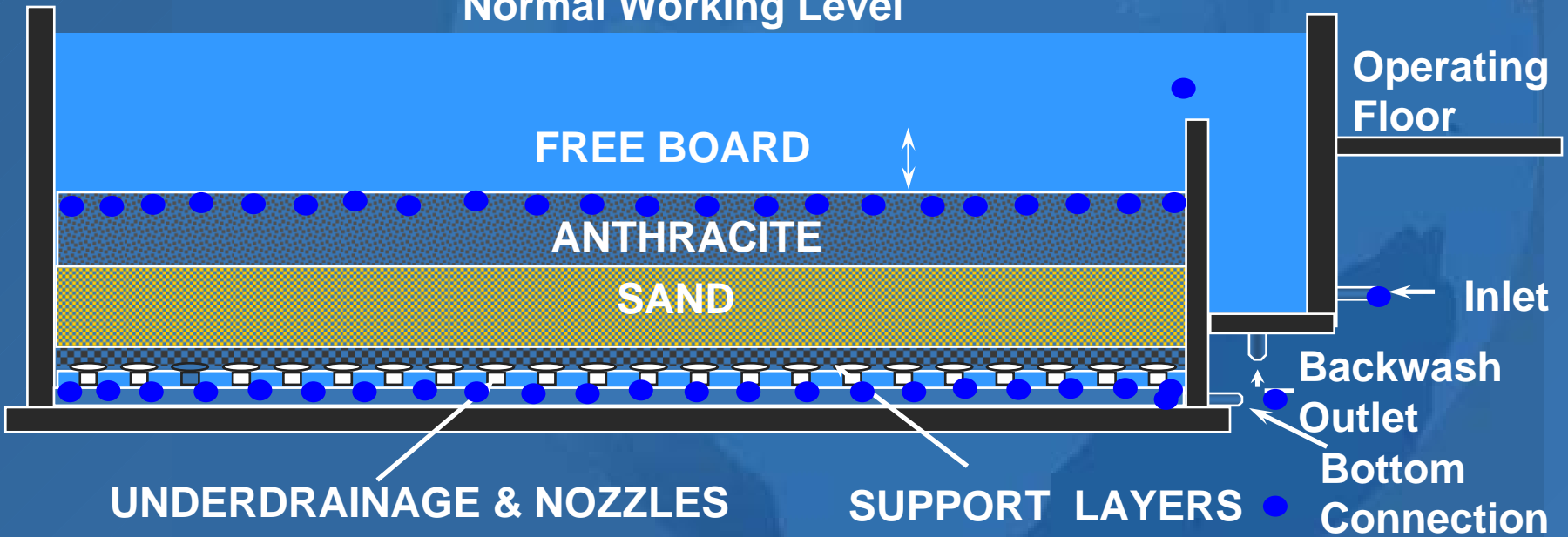
VERTICAL TYPE PRESSURE FILTER (DUAL MEDIA)



GRAVITY TYPE FILTER

FILTER CROSS SECTION

Normal Working Level



FILTER MEDIA/FILTRATION PROCESS



**Selection
of
Filter Media**

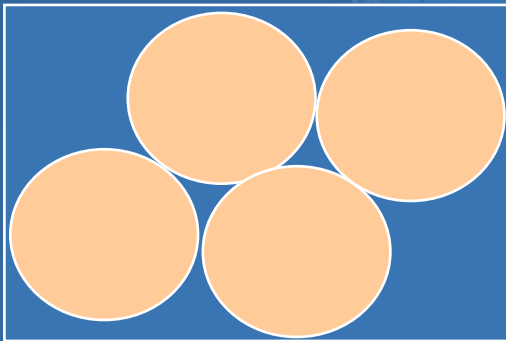
SELECTION OF FILTER MEDIA

- ◆ Particle size distribution
- ◆ Uniformity coefficient
- ◆ Size range
- ◆ Effective size
- ◆ Specific gravity

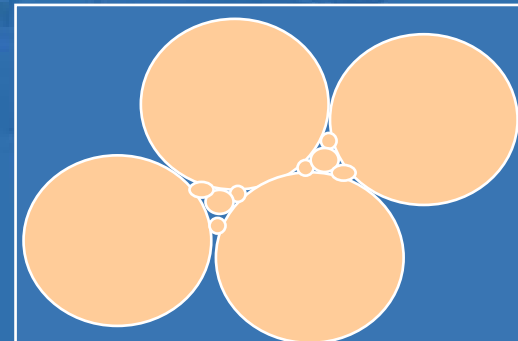
SELECTION OF FILTER MEDIA

Particle size distribution

- ◆ Use filter media of narrow size distribution for good porosity, long filter runs and no loss of filter media during backwash



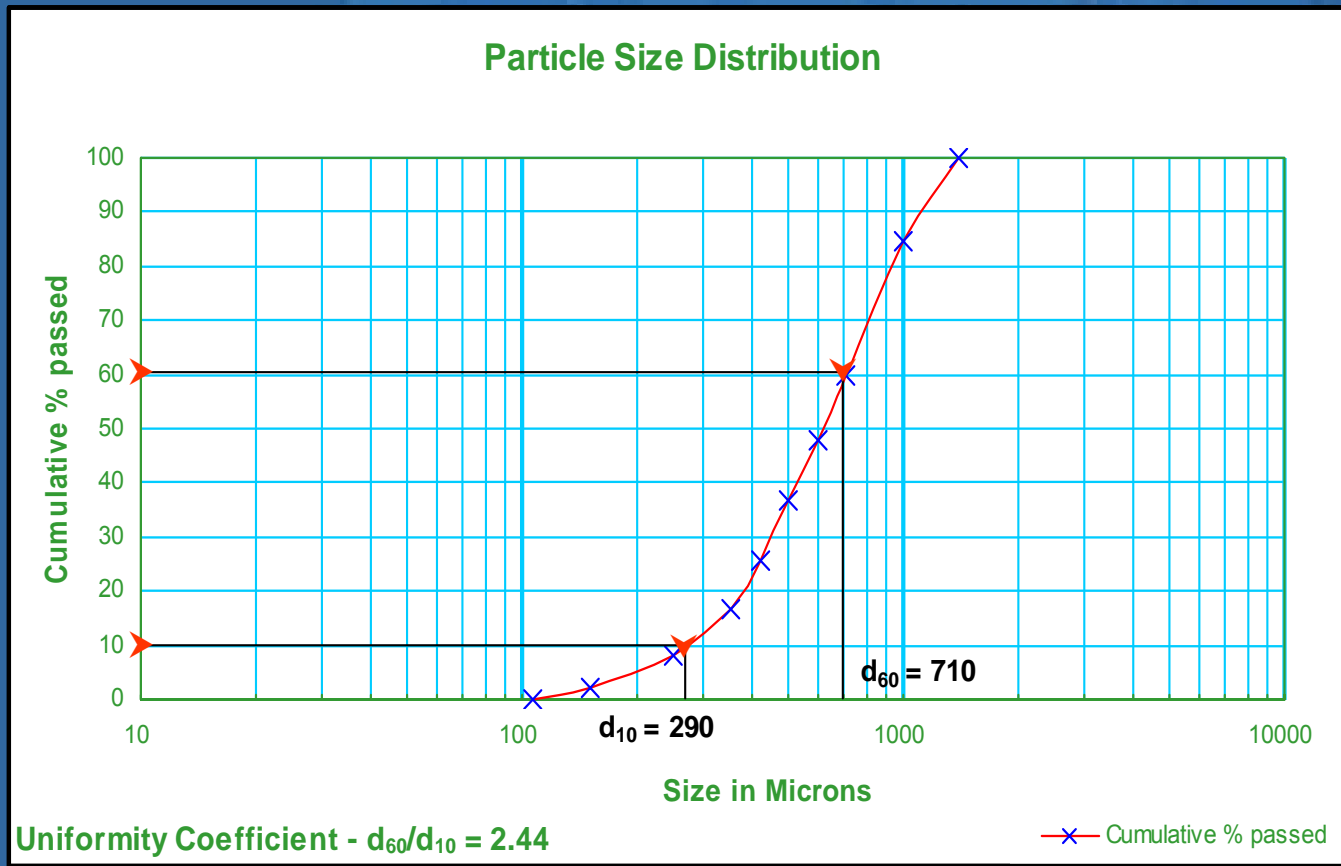
Good porosity



Bad porosity

SELECTION OF FILTER MEDIA

Uniformity Coefficient



SELECTION OF FILTER MEDIA

- ◆ **Size range (i.e. 0.425-0.85 mm)**
- ◆ **Effective size = d_{10}**
- ◆ **Specific gravity**

DELMON CO LTD FLOW DIAGRAM



DELMON CO LTD LABORATORY FOR QA/QC

Analyses performed by lab for QA/QC

- Sieve analysis
- Average fine size
- Average grain size
- Moisture content
- Silica content
- Clay content
- Bulk density
- Specific gravity
- Acid solubility
- ADV (Acid demand value)
- LOI (Loss on ignition)
- pH-Test

LABORATORY FOR QA/QC



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LABORATORY FOR QA/QC



LABORATORY FOR QA/QC



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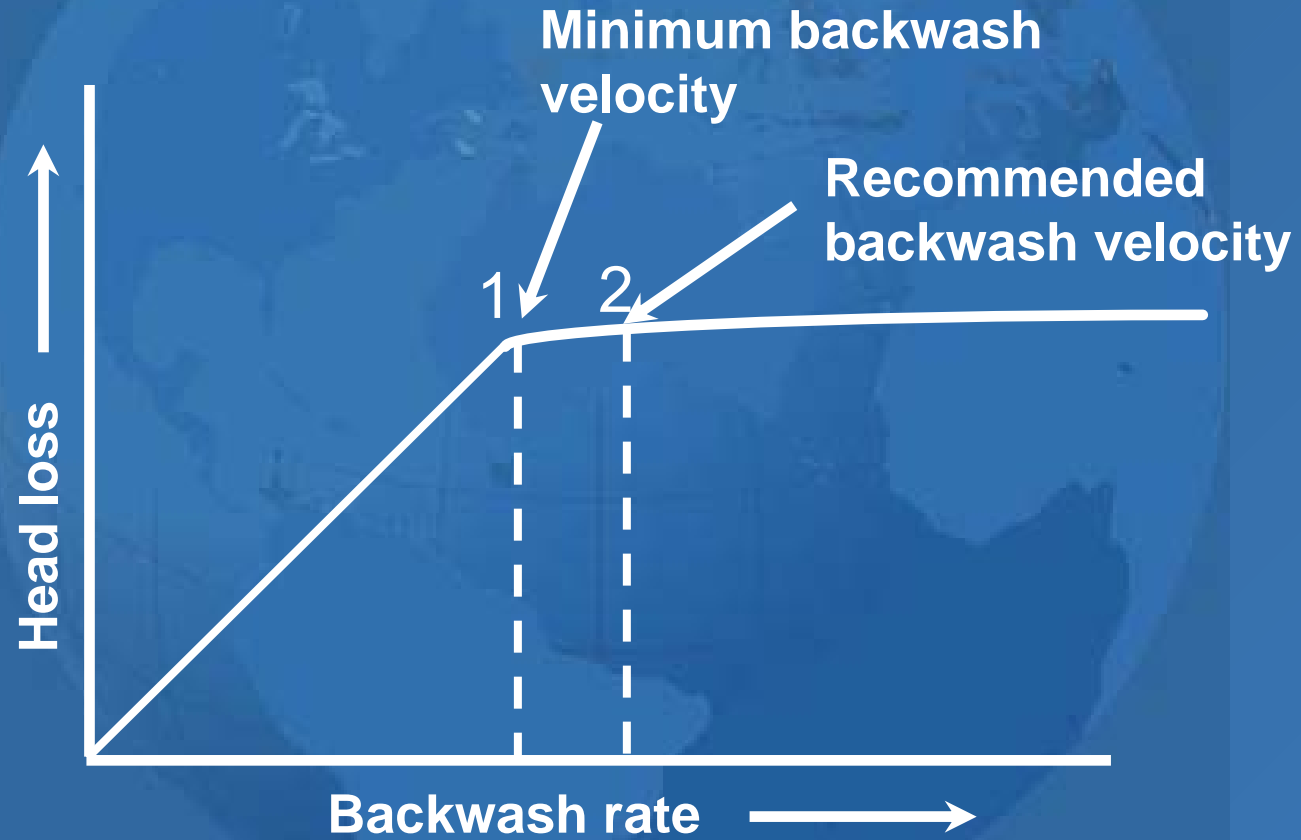
LABORATORY FOR QA/QC



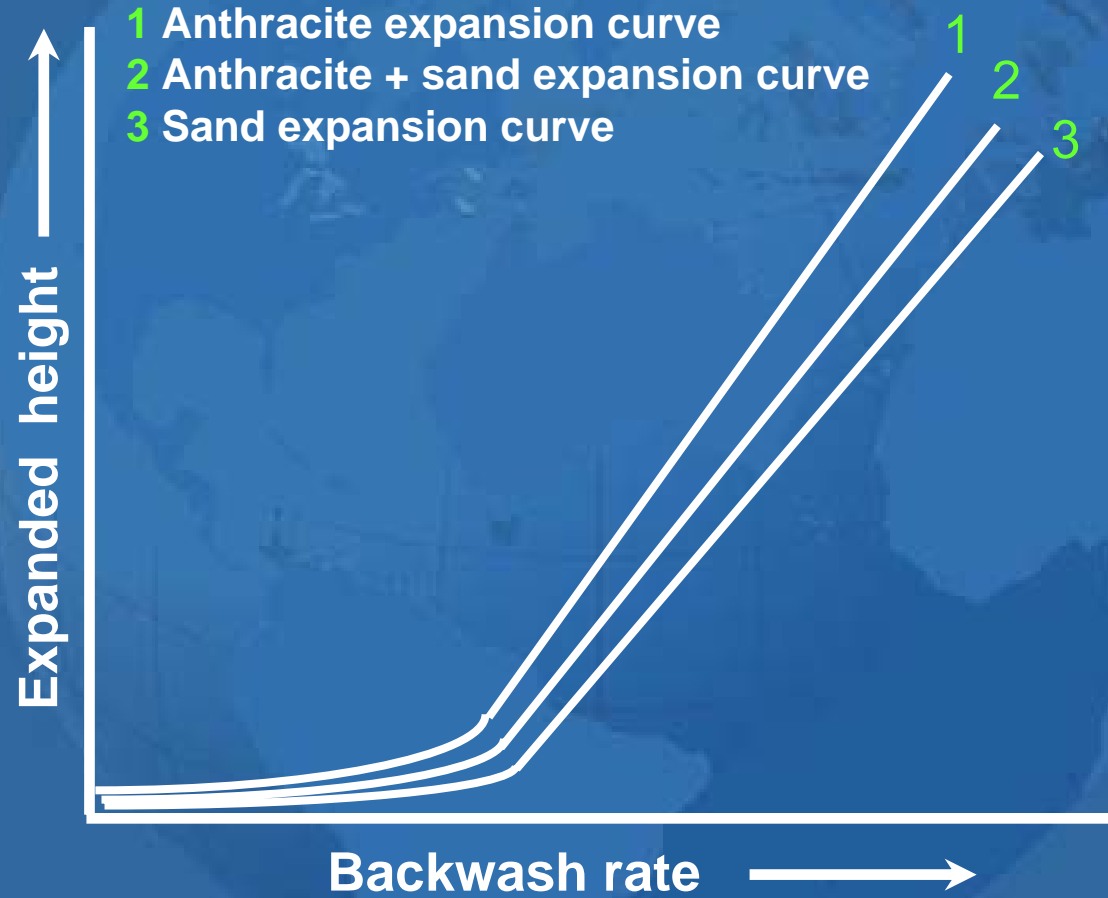
PILOT PLANT TESTING OF FILTER MEDIA



DETERMINATION OF OPTIMUM BACKWASH VELOCITIES



DETERMINATION OF BED EXPANSIONS



CONCLUSIONS

- ◆ **Use narrow size distribution filter media (sand U.C.<1.3, anthracite U.C.<1.5)**
- ◆ **Use compatible filter media configuration by considering the size range and specific gravity**
- ◆ **Take all necessary precautions and care in all the stages involved in the processing of the filter media (washing drying screening and packing) and most importantly QA/QC**
- ◆ **Determine optimum backwash velocities and bed expansions for best filter media cleaning and to avoid loss of filter media during backwash**

END OF PRESENTATION

**GENTLEMEN
YOUR QUESTIONS
ARE WELCOME**



WASHING THE RAW MATERIAL





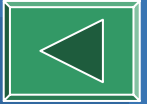
DRYING THE WASHED MATERIAL





SCREENING THE DRIED MATERIAL





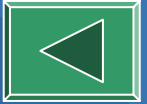
SCREENING THE DRIED MATERIAL





PACKING MACHINE





STORING THE SCREEN MATERIAL

