Media Filter A Loading Report Prepared for Valued Customer:

Koch Methanol

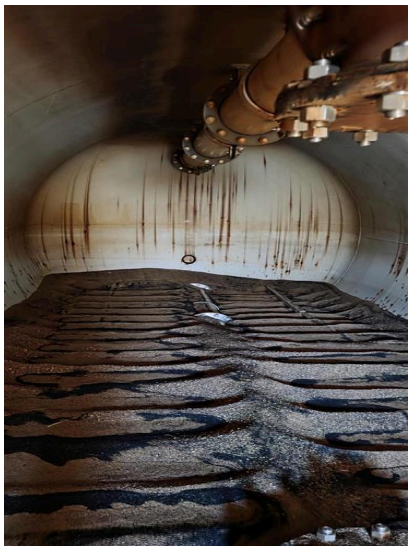
St. James, LA

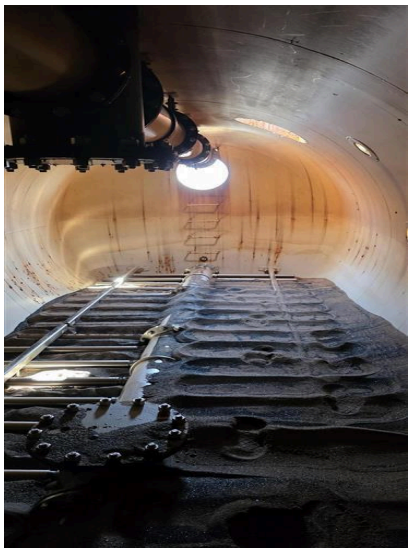
Jacob Errington
Koch Methanol
St. James, LA

Sepratech is pleased to present Koch Methanol with a follow-up regarding the media loading and initial backwash. Sepratech performed a media replacement on the A Horizonal Filter.

1. MEDIA REMOVAL

Sepratech supplied labor and equipment to remove the spent media in the F-05501A filter. During the prior media filter review, it was noted that the media level was low. This was confirmed upon initial entry into the filter (Figure 1.0 and 1.1).





Figures 1.0 and 1.1 – Media Level Prior to Removal

Sepratech used vacuum equipment to remove the media from the media filter. Bottom laterals were removed for off-site cleaning. It was discovered that the bottom laterals are wedge wire screen laterals (Figure 1.2). The wedge wire screen laterals were inspected and no defects were discovered. Sepratech inspected the outlet header and found no defects. The condition of the outlet header/laterals indicates a different route of media loss for filter A.

The wedge wire screened laterals were cleaned off-site at Sepratech's shop. The laterals were pressure washed to remove surface contaminant.

Once laterals were cleaned, they were returned to Koch's facility and installed inside the filter. A final inspection was performed on the internals of the vessel prior to loading the media.

Figure 1.2 – Wedge Wire Screened Bottom Laterals

2. MEDIA LOADING

This media recipe was modified from the original design of the filters by the addition of a garnet layer. By adding the garnet layer, the filter would have additional volume of media compared to the original design. To accommodate this new garnet layer, an equal volume was removed from the anthracite layer.

New media recipe:

- 203ft^3 of 1½" x ¾" Gravel
- 101ft^3 of ¾" x ½" Gravel
- 101ft^3 of ½" x ¼" Gravel
- 101ft^3 of ¼" x 1/8" Gravel
- 101ft^3 of #6 x #12 Gravel
- 101ft^3 of 50mesh Garnet
- 375ft^{3}of 20 x 40 Sand
- 557ft^3 of 0.85-0.95mm Anthracite

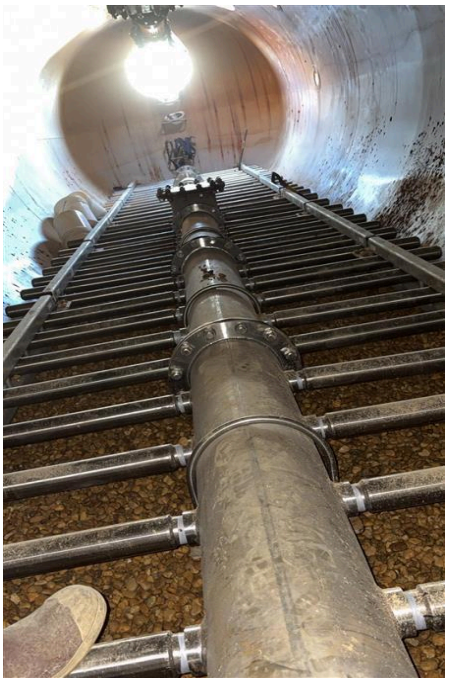
Previous media recipe:

- 203ft^3 of 1½" x ¾" Gravel
- 101ft^3 of ¾" x ½" Gravel
- 101ft^3 of ½" x ¼" Gravel
- 101ft^3 of ¼" x 1/8" Gravel
- 101ft^3 of #6 x #12 Gravel
- 375ft^{3}of 20 x 40 Sand
- 657ft^3 of 0.85-0.95mm Anthracite

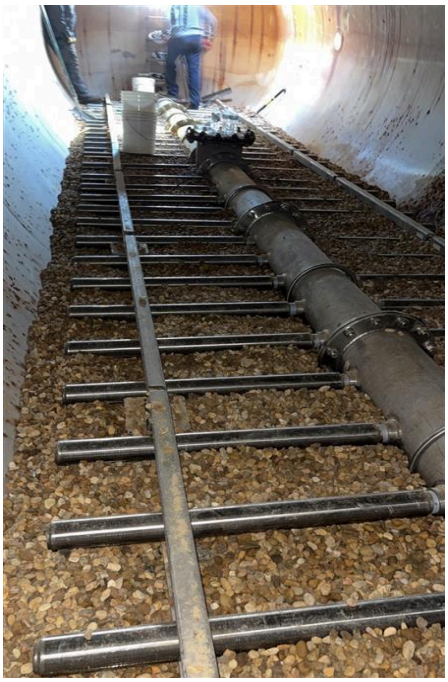
The addition of the garnet layer was encouraged to improve the filtration capabilities of the filter. The garnet provides a tighter pore size for particle removal than sand and anthracite provide.

Sepratech loaded each layer individually starting with the largest gravel and ending with the anthracite. Each layer was poured into the vessel using bulk bags and a crane. Every layer was leveled manually prior to loading the subsequent layer.

1st layer – 1½" x ¾" gravel



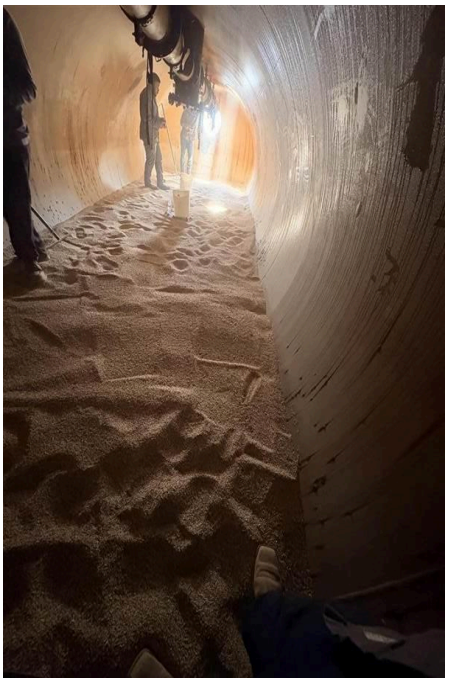
2nd layer - ¾" x ½" gravel



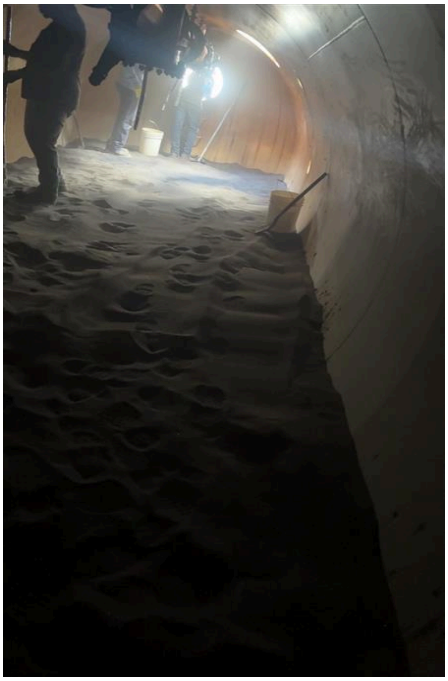
3rd layer – ½” x ¼” gravel

4th layer – ½” x 1/8” gravel

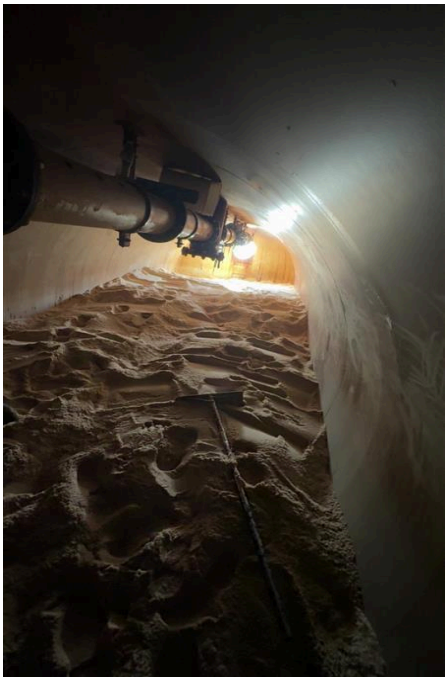
5th layer - #6 x #12 gravel



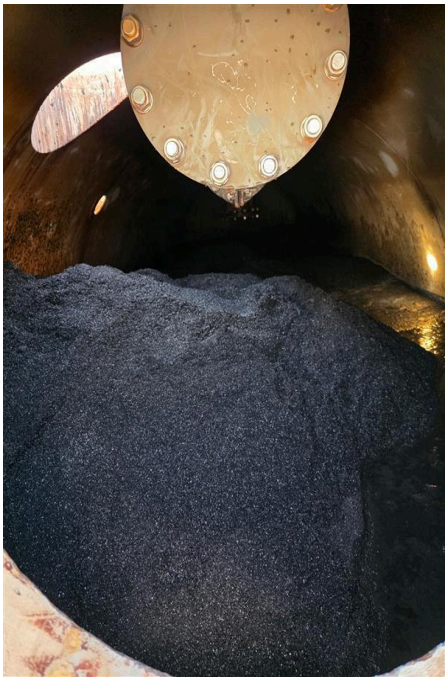
6th layer – 50mesh garnet



7th layer - 20 x 40 sand



8th layer – 0.85-0.95mm anthracite



After the media was completely loaded, Koch was encouraged to soak the media for 24hours prior to performing a backwash.

3. INITIAL BACKWASH

Koch requested the presence of Sepratech personnel during the initial backwash and rinse of filter A after the vessel has completed the soak process.

During the initial backwash, the filter's drain down step was observed. The drain down step was allowed to drain for about twenty-two minutes to reach an air space of 8" between the water level and the bottom of the top header. Sepratech encouraged Koch to continue to monitor the drain down step for the next few backwashes. The time may need to continue to be adjusted as the media continues to rinse in through a series of backwashes.

The air scour step was not initiated during the initial backwash.

The vessel was backwashed for about double the normal backwash time. The backwash discharge reached a turbidity of about 24NTU. Backwash feedwater turbidity was less than 1NTU.

Fast rinse step was performed for five minutes. Turbidity of the filter effluent reached about 12NTU. Additional time was determined to be needed; however, the waste sump level limited the amount of water that could be used during the rinse process.

Later, Koch personnel completed additional rinses on the filter until the filtrate turbidity reached the targeted specification.

4. NOTES ON FILTER A MEDIA LOSS

During the initial backwash study of the media filters, it was noted that the media level was very low in Filter A. After inspection of the internals of the media filter along with review of the initial backwash study, it can be surmised that the loss of media was due to performing the air scour step while the water level was too high in the media filter. After the media would be captured in the inlet header, the subsequent backwash step would flush the media into the nearby waste sump.