



# FLETCHER CREEK IMPROVEMENT DISTRICT

RR2, Site 3, Comp 38  
Kaslo, BC V0G 1M0

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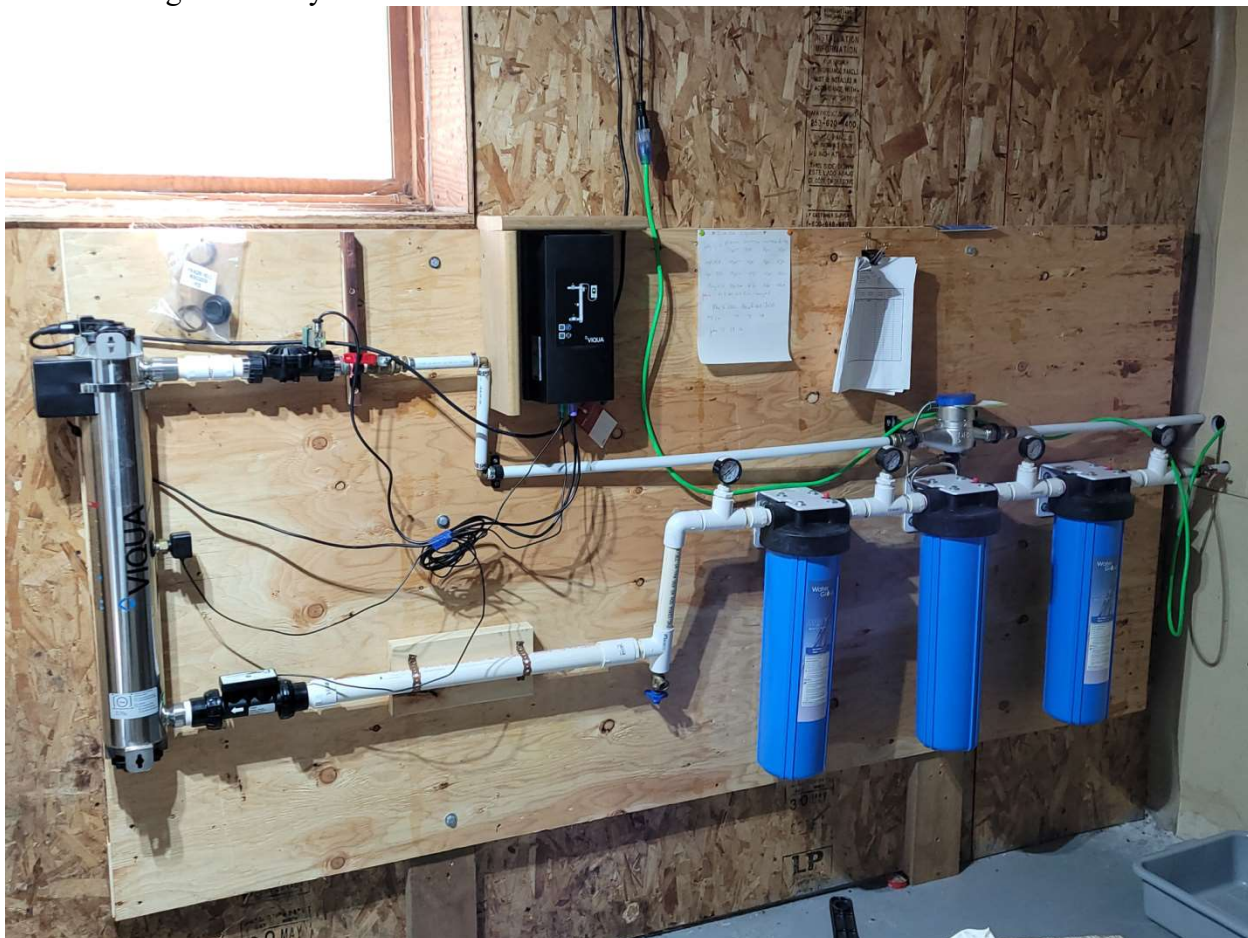
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## **Interim Report: Fletcher Creek Improvement District Pilot Study**

**Purpose of the Pilot Study:** The purpose of the pilot study is to gather data to develop a design basis for the treatment of water sourced from the Fletcher Creek. The Pilot Study will prove the effectiveness of particle filtration and ultra violet disinfection to yield potable water meeting the *Guidelines for Canadian Drinking Water Quality*<sup>1</sup>.

**Methodology:** Use Fletcher Creek water as the feed to a three stage filtration system with ultraviolet disinfection. Cumulative water throughput of the filter media and corresponding pressure drop (at a measured flow rate) will be recorded<sup>2</sup>. Test the treated water on a regular interval to demonstrate compliance with Provincial potable water objectives<sup>3</sup>.

**Apparatus:** In Phase I of the study, an existing treatment system installed in 2018 was used as the test site. The treatment system includes a volumetric flow meter<sup>4</sup>, a primary 75/25 micron filter, a secondary 25/01 micron filter, a 1 micron absolute filter, and an ultraviolet disinfection cell. The filter housings are the common 20" "Pentek Big Blue" available from The Water Guy and others. The ultraviolet disinfection cell is a Viqua PR020, is NSF 55 Class A compliant, and is capable of treating 20 usgpm at 40 mJ/cm<sup>2</sup> light intensity.



Results:

- 1) The test was initiated May 16, 2021. The cartridges were weighed new, before being put into service.
- 2) The volumetric flow meter reading was recorded.
- 3) The overall pressure drop was noted (not recorded) as zero.
- 4) The pressure drop across the filtration system was deemed excessive but was not recorded.
- 5) Phase II of the study was initiated on September 1, 2021.
- 6) The in-service filter cartridges were removed and set into pails to drain.
- 7) New cartridges were weighed and installed.
- 8) The volumetric flow meter reading was recorded as 5800 ft<sup>3</sup> (160,000 litres).

# Table 1: Historical Operations Record

~~Bulb~~ Due July 11/2019 ~~\*~~

	psi Entry	Post 1st Filter	Post 2nd Filter	Post 3rd Filter
July 11/18	70 psi <sup>+/-</sup>	70 psi	70 psi	69 psi
Sept 10/18	70 psi <sup>+/-</sup>	70 psi	70 psi	69 psi
April 19/19	70 psi <sup>+/-</sup>	69 psi	69 psi	68 psi
May 2/19	70 psi <sup>+/-</sup>	67 psi	66 psi	66 psi
July 12	All filters and Bulb changed.			
May 16/2021	New filters & Bulb			
	72 psi	71	70	70
July 7/	48 - 32 -			

- 1) Pressure data records are upstream of the first filter, upstream of the second filter, upstream of the third filter and upstream of the UV cell.
- 2) The data recorded for "July" presents only three data points; inlet to system, downstream of first filter, and upstream of the UV cell. Thus, overall system pressure drop is  $71 - 32 = 39$  psi.

The filter cartridges were allowed to drain with the sediment and water collected in pails. The cartridges were weighed routinely to determine how much sediment was collected in each. When the weight of the cartridge stopped changing, it was deemed dry so the weight difference from new to used could be attributed to collected sediment.

Date	Water Meter Reading (ft3)	Weight of 7525 cartridge (grams)	Weight of 2501 cartridge (grams)	Weight of 1 abs cartridge (grams)
2021-05-16	0	812	898	531
2021-09-01	5800	931	914	574
Mass collected in cartridge(g)=		119	16	
Mass collected in drain pail(g)=		3	Too small to measure	
Total Mass collected (g)=		122	16	

#### Qualitative Evidence:

Visual Inspection of the cartridge elements allows some qualitative assessment. See the annotated photographs below:

Figure 1: The three filter cartridges at the end of Phase I

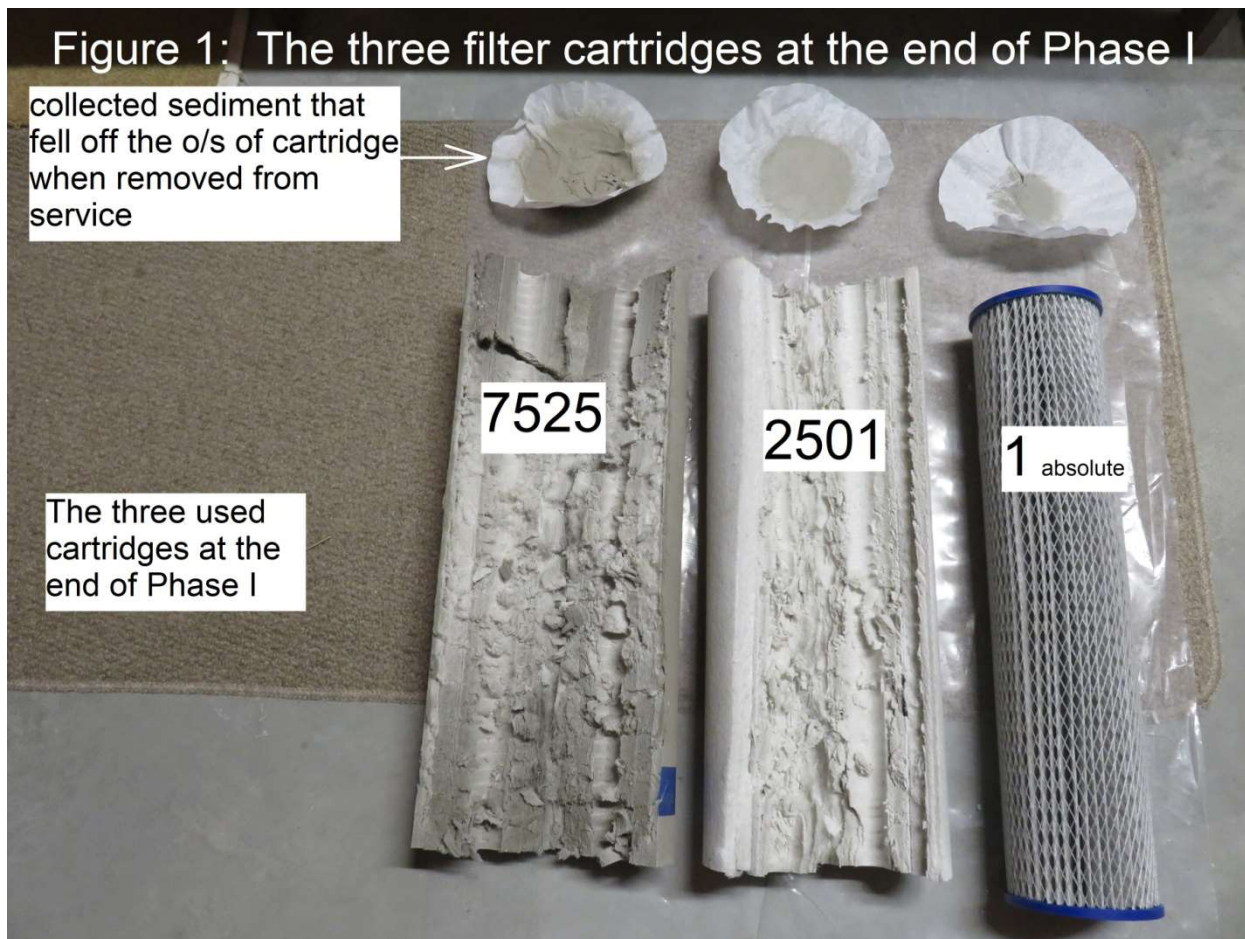
collected sediment that  
fell off the o/s of cartridge  
when removed from  
service

7525

2501

1 absolute

The three used  
cartridges at the  
end of Phase I



heavier staining  
at ends

boundary  
between 75  
and 25 micron  
media

boundary  
between one  
half and the  
other

Figure II:  
7525  
Internals  
After Use

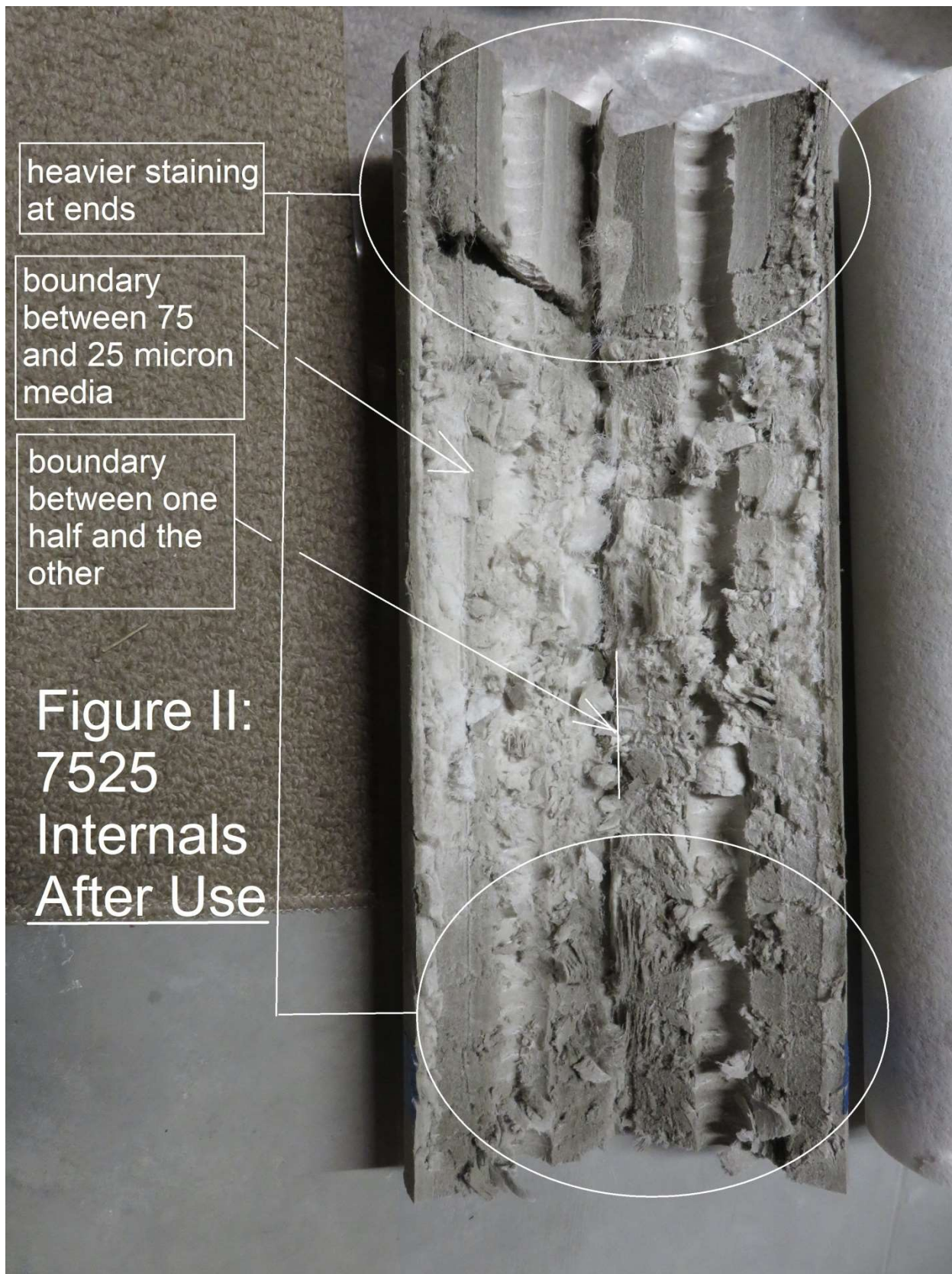


Figure III: 2501 Internals After Use

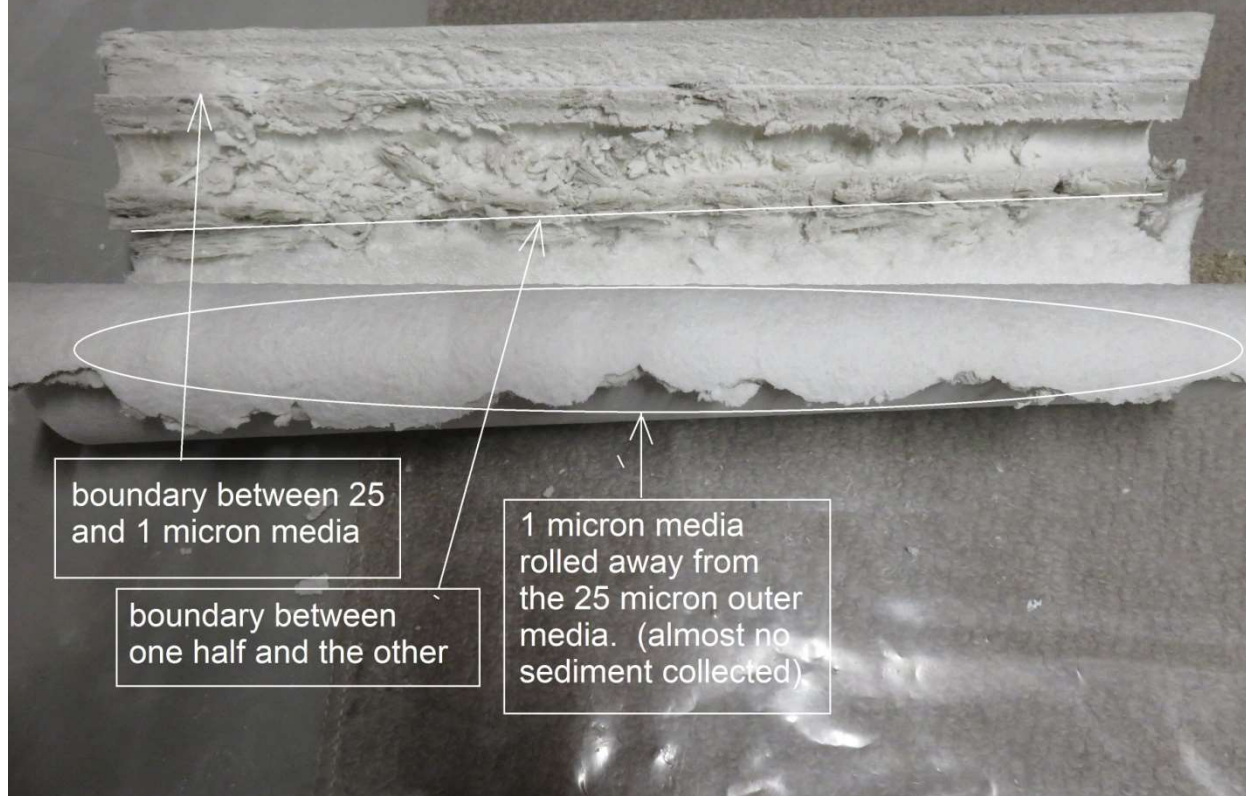
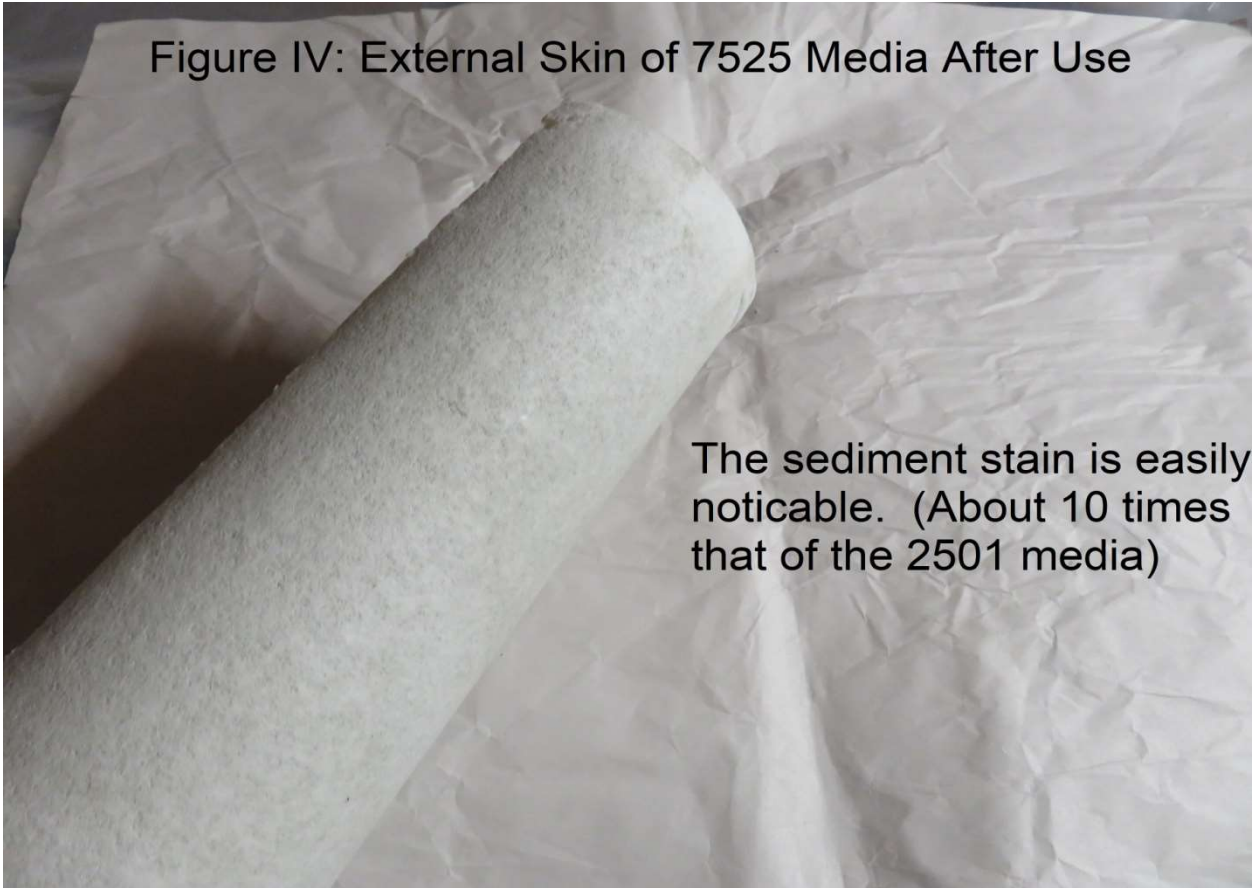


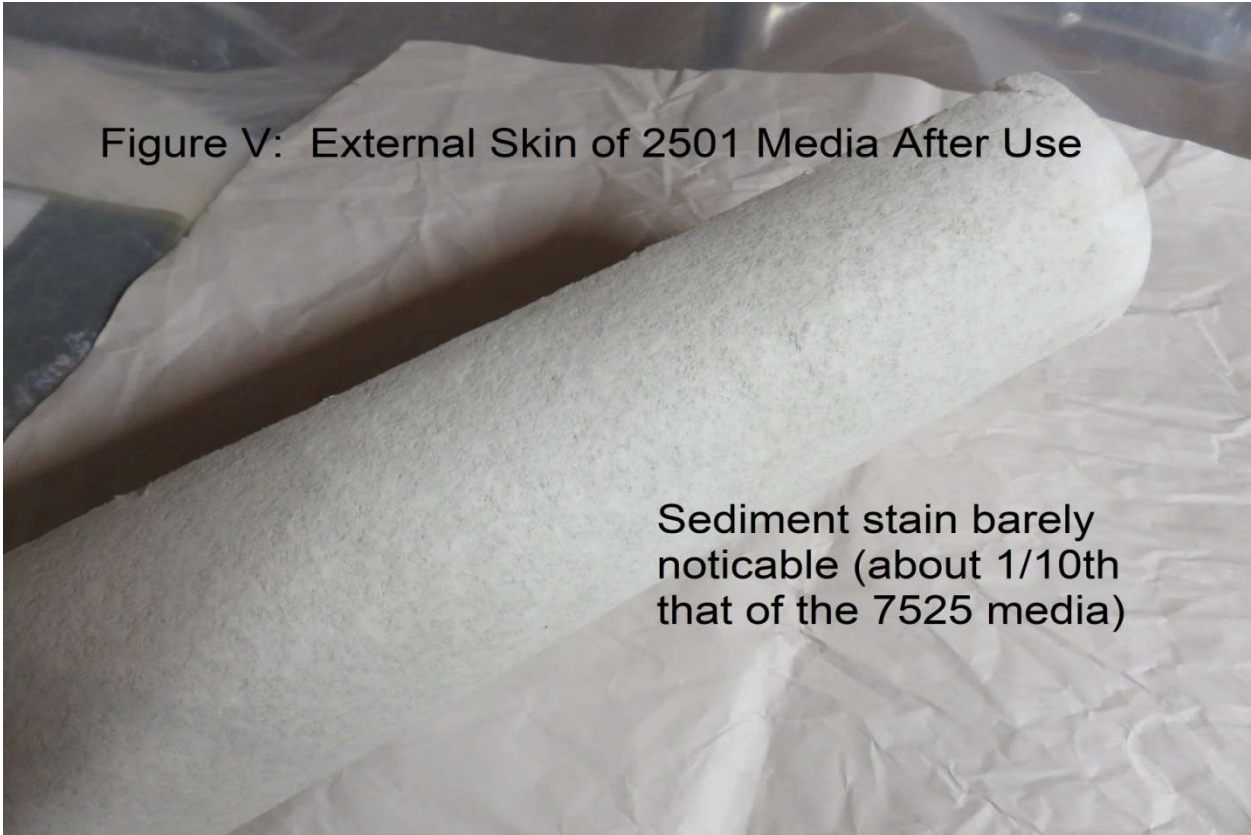
Figure IV: External Skin of 7525 Media After Use



The sediment stain is easily noticable. (About 10 times that of the 2501 media)

Figure V: External Skin of 2501 Media After Use

Sediment stain barely  
noticable (about 1/10th  
that of the 7525 media)





#### Observations:

- 1) The sediment collected in the 7525 filter is significant. The sediment is collecting in both the 75 micron and the 25 micron media. The filter is likely aptly applied.
- 2) The sediment collected in the 2501 filter is very small. Sediment is not being collected in any observable amounts in either the 25 or the 1 micron media. This filter could likely be eliminated.
- 3) The sediment collected in the 1 micron absolute filter is significant but only 1/3 that collecting on the 75/25 filter. The external surface of the filter media has no visible accumulation of sediment.

#### Footnotes:

- 1 Phase I data does not include treated water turbidity measurement but it will be included in successive phases once the intake turbidity rises above 1 NTU.

- 2 Pressure drop as a function of flow rate was not recorded as part of Phase I but will be included in successive phases.
- 3 The host of the pilot study has been operating the treatment system since 2018 and has a perfect record for water analysis by Interior Health meeting Interior Health's specifications.
- 4 The volumetric flow meter was the only piece added in the spring of 2021 specifically for the pilot study.