CASE STUDY: HOW HORIZONTAL DESANDERS COMPARE AGAINST SPHERICAL SAND SEPARATORS

A Northern BC well operator compared SDI Desanders and spherical sand separators on a two well pad side by side trial. On Well A, the SDI Desander was upstream of the spherical sand separator, and on Well B, SDI was downstream of the spherical sand separator. In this study, SDI outperformed the spherical sand separator capturing more sand overall and a higher percentage of sand. It also allowed the client to analyze the pros and cons of each sand separation system.

HIGHLIGHTS

-Well A SDI 1st in series, SDI (captured 1712 kg/3774 lb)
spherical sand separators captured 113.5 kg/250 lb downstream 94% efficiency

-Well B spherical sand separators 1st in series, (captured 1510 kg/ 3329 lb)
SDI captured 833 kg/ 1836 lb downstream 65% efficiency

Location	Measured Sand Volume	Estimated Sand Volume from SDI Sand Sentry	Efficiency	Sand Particle Results (micron µm)	Sand Particle Results (mesh)
Well A (SDI Desander 1st)	754.8L (1712 kg) 199 gal (3774 lb)	686L (1361 kg) 181 gal (3000 lb)	94%	D50 - 28.9µm Range - 0.52-684µm 26% <200µm	D50 – 460 mesh Range – 18,000-25 mesh 26% <80 mesh
Well A (Spherical Separator 2nd)	50L (113.5 kg) 13 gal (250 lb)	No Sand Sentry		D50 - 182.4µm Range - 0.39 -825µm 53% <200µm	D50 - 85 mesh Range – 23,500-20 mesh 53% <80 mesh
Well B (Spherical Separator 1st)	666L (1510 kg) 176 gal (3329 lb)	No Sand Sentry	65%	D50 - 310µm Range - 0.76-684µm 16% <200µm	D50 - 50 mesh Range – 12,750-25 mesh 16% <75 mesh
Well B (SDI Desander 2nd)	356.9L (809 kg) 94 gal (1783 lb)	367L (833 kg) 97 gal (1836 lb)		D50 - 118.2µm Range - 0.393-356µm 86% <200µm	D50 - 125 mesh Range – 23325-45 mesh 86% <80 mesh

The goal of this study was to quantify the sand captured by both the horizontal and spherical sand separators. For measurement of the SDI units, the liquid was drained, the separator cap was opened, sand scraped into the containment tub, and vac trucks were used to skim the liquids from the containment tub. The sand was quantified by weight and volume. For the competitor, there was no option to open and inspect the washout trucks onsite. So, each vessel was cleaned out using a separate trailer, and the sand was measured and sampled at the disposal site.

Results for each desander are as follows:

WELL A (SDI HORIZONTAL DESANDER FIRST IN SERIES)

Measured Volume (+/- 15%)

V= W*L*H
= (66” - 6”) * (101” - 6”) *8”
= 45600 in2
= 0.747 m2 (747L)

Add 10L (22.7kg) from skimmed sand loss
Subtract 2.2L (5kg) to standardize the baseline with spherical sand separator unit

Total Sand Removed
754.8L (1712kg) / 199 gal (3774 lb)

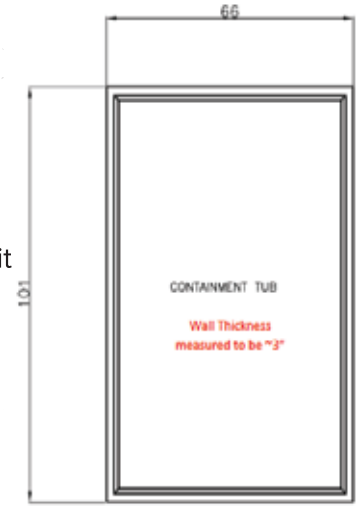


Figure 1 - SDI Supplied Containment Dimensions for Volume

WELL A (SPHERICAL SAND SEPARATOR SECOND IN SERIES)

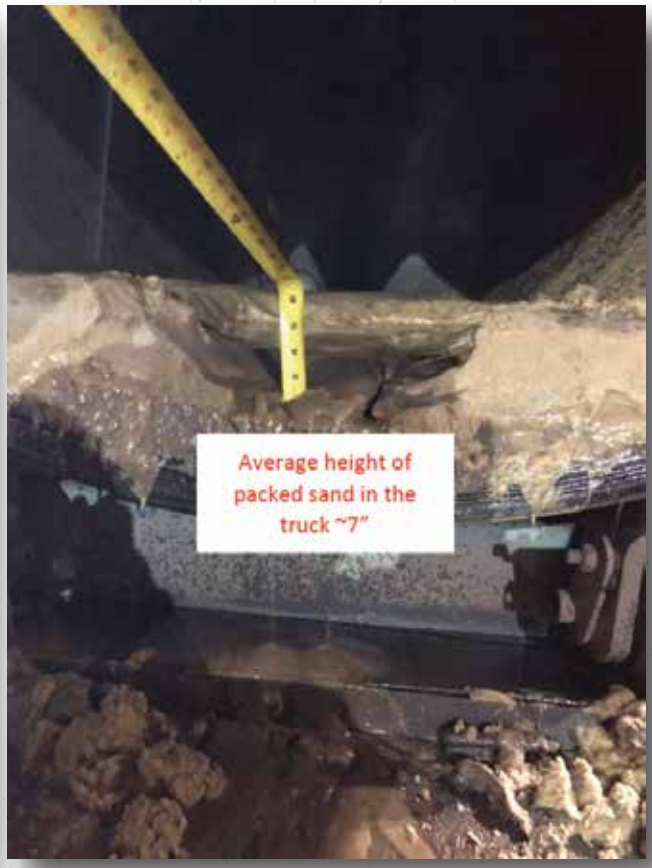
The vessel was emptied into its own trailer via vac truck. To be consistent, this was the same trailer that the Well A SDI containment fluids were skimmed to. When the vessel was opened, there was not enough sand to measure, so we relied on trucking estimates.

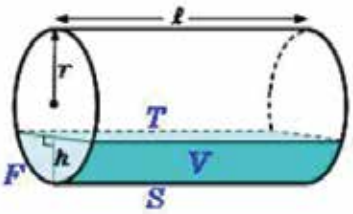
Measured Volume
N/A – could not be physically measured at the trucking disposal site
Vac Truck Estimated Numbers
Sand removed – 60L (22.7 kg)
Subtract 10L (22.7kg) due to sand gained when skimming the SDI containment

Total Sand Removed
50L (113.5 kg) 13 gal(250 lb)

WELL B (SPHERICAL SAND SEPARATOR FIRST IN SERIES)

The separator was emptied into its own trailer via vac truck on site. The truck was opened at the disposal site, the height x width x length of the sand in the truck was quantified, and a sand sample was taken.





Total Sand Removed
666L (1510 kg) 176 gal (3329 lb)

V = Calculated based on measured values
= 29887 in³
=0.489 m³ (489L)

Subtract 10L (22.7 kg) due to sand gained when skimming the SDI containment tub

SPECIALIZED DESANDERS

desanders.com

WELL B (DESANDER SECOND IN SERIES)

The SDI Desander was drained into a containment tub, skimmed, and measured.

Total Sand Removed
356L (809kg) 94 gal (1784 lb)

SUMMARY

Samples were taken from each of the four separators and sent for particle size and composition testing. It is assumed that the measured volumes fall within a range of +/- 15%. Factors include the amount of liquid contained within the sand emulsion. The overall volume of cleaned out sand falls within a reasonable range when comparing the measured numbers by SDI and the vac truck measurements. The major takeaway is that there was a much higher amount of sand found in the desander on Well B when SDI was second in series. These results show that there is a significant carryover of sand in the spherical sand separator designs.