



STRUVITE

Struvite Control Case Study Denver, Colorado, USA

A 60-day independent trial verified that Hydropath treatment prevented new struvite scale while gradually softening existing deposits for easier removal.

60 Days

Third-Party Trial

0

New Scale Formation

✓

Easy Scale Removal

4x

Units Purchased After Trial



BEFORE & AFTER

● BEFORE

- Heavy, hard struvite restricted pipe diameter
- Transfer pump needed acid cleaning twice yearly
- Scale reached ~1/8 inch thick

● AFTER

- ✓ Cleaned pipe sections remained free of deposits
- ✓ Existing scale became soft and easy to remove
- ✓ More clean pipe surface became visible



BEFORE

Heavy struvite on transfer pump



AFTER

Soft, thin scale after treatment



OVERVIEW

The Robert W. Hite Treatment Facility in Denver is rated at 220 million gallons per day and treats an average of 135 million gallons daily for more than 1.8 million people. Struvite and other mineral deposits accumulated in the centrate and digester piping, particularly at the transfer pump and discharge pipe. A 60-day trial, independently verified by CH2M, assessed whether Hydropath technology could prevent new scale formation and soften existing deposits.



CHALLENGE

Persistent struvite and mineral scale reduced the discharge pipe's internal diameter and required periodic shutdowns for cleaning.

- Hard scale reduced the internal diameter of the centrate discharge pipe.
- Heavy struvite encrustation forced the transfer pump offline for acid cleaning twice a year.
- Before the trial, scale was approximately 1/8 inch thick, hard and greyish.
- Centrate was transferred continuously, 24 hours per day.



SOLUTION

Two *HydroFLOW*® i Range units were installed on the centrate line, one at the transfer pump suction and one on the discharge side, with weekly sampling and visual inspections.

UNIT INSTALLED

2x *HydroFLOW*® i Range

PIPEWORK

8-inch glass-lined ductile iron centrate pipe

INSTALLATION POINTS

Transfer pump suction and discharge

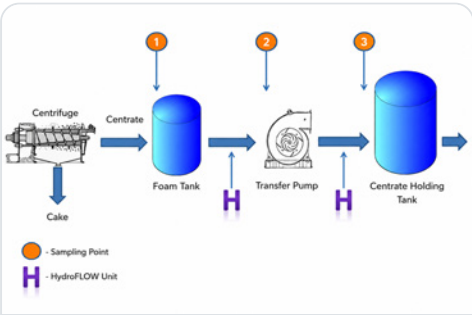
TRIAL PERIOD

60 days from 1 March 2017



INSTALLATION

HydroFLOW® unit installed



DIAGRAM

Centrate system layout



RESULTS



No New Scale Formation

Cleaned pipe sections remained free from new struvite scale during the trial.



Existing Scale Softened

Existing deposits became thinner, softer and easier to wipe away.



Pipe Surface Re-exposed

Centrate flow gradually removed softened scale, exposing more of the pipe surface.



Water Chemistry Monitored

Weekly sampling tracked soluble constituents throughout the 60-day trial.



Trial Independently Verified

CH2M independently verified the sampling data, inspections and site observations.



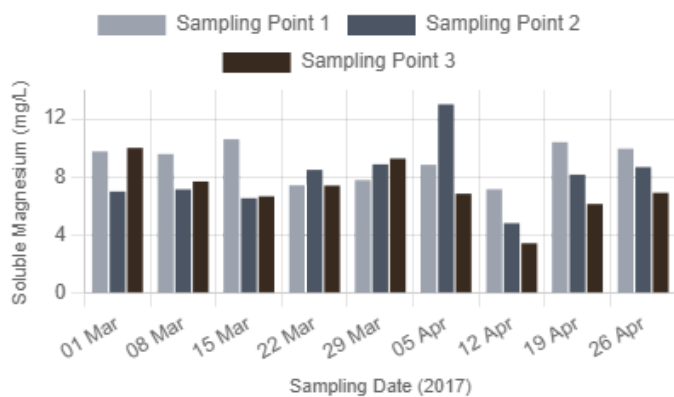
Four Units Installed

Following the trial, RWHTF installed four units on centrate and sludge lines.



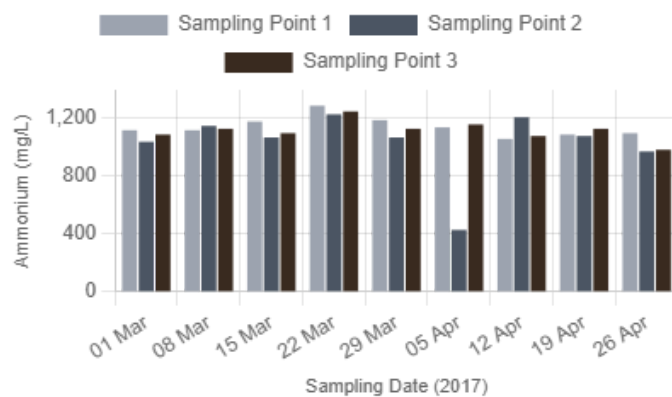
GRAPHS

Soluble Magnesium Concentration Profile



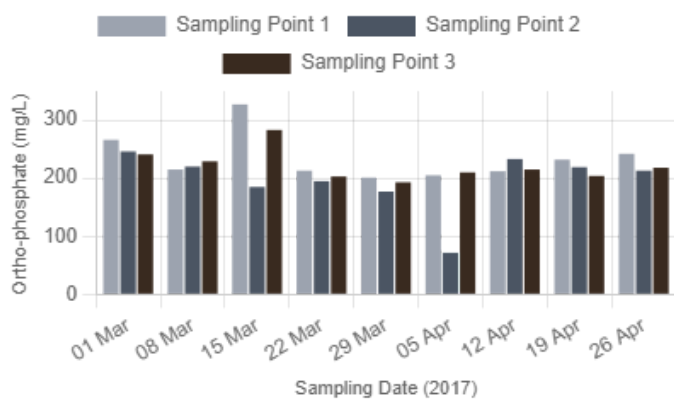
Magnesium: Despite scale-forming levels, magnesium at points 2 & 3 was as high as at 1, remaining in the fluid rather than scaling out.

Ammonium Concentration Profile



Ammonium: Despite scale-forming levels, ammonium at points 2 & 3 was as high as at 1, remaining in the fluid rather than scaling out.

Ortho-phosphate Concentration Profile



Ortho-phosphate: Despite scale-forming levels, phosphate at points 2 & 3 was as high as at 1, remaining in the fluid rather than scaling out.

KEY TAKEAWAY

Summary

At Denver's Robert W. Hite Treatment Facility, two *HydroFLOW*® i Range units were tested on an 8-inch centrate line for 60 days. Independent review found no new struvite formation in cleaned areas, while existing hard deposits became thinner, softer and easier for flowing liquid to remove. The successful trial was followed by the purchase and installation of four units on centrate and digested sludge lines.

60 days

THIRD-PARTY VERIFIED TRIAL

0

NEW SCALE DEPOSITS

4

UNITS INSTALLED AFTER TRIAL

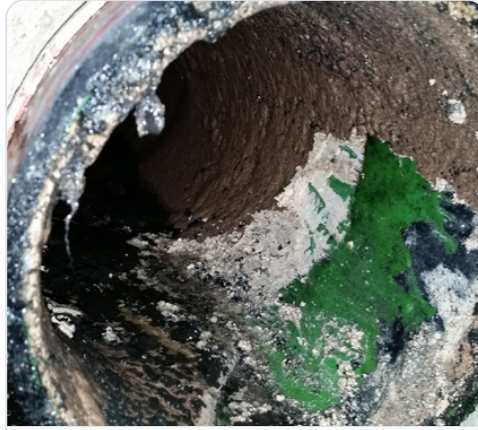


ADDITIONAL PHOTO EVIDENCE



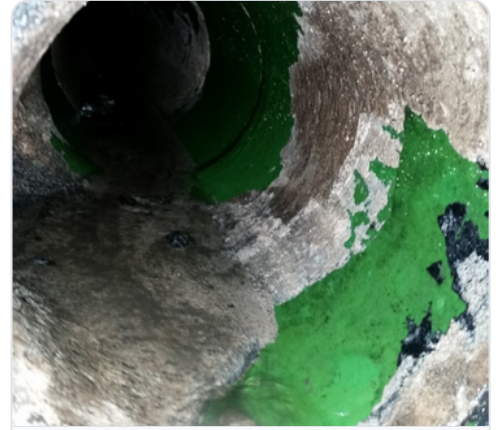
BEFORE

Heavy scale inside the transfer pump



AFTER

Cleaned pipe section at trial start



AFTER

More glass-lined pipe exposed after 60 days

RELATED CASE STUDY

East Hyde Struvite Scale Control Case Study

Luton, UK

Severe struvite scaling repeatedly disrupted centrate lines at East Hyde Sewage Works. After one HydroFLOW® unit was installed, no additional scale formed throughout the six-month trial, helping reduce maintenance and improve centrifuge efficiency.

No New Scale for 6 Months

The centrate line showed no additional struvite scale throughout the trial.

Reduced Maintenance

Stable scale conditions reduced the need for maintenance intervention.

Improved Centrifuge Efficiency

The centrifuge operated more efficiently following installation.

HYDROPATH 

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Get a free consultation for your wastewater facility.

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