A pilot study at Lund University, using XRF-analysis, have shown an As-anomaly with elevated concentrations in an Ordovician shale from a drill core obtained in the Lerhamn area, northwestern Scania, southern Sweden. In this follow-up study a deeper geochemical analysis with focus on arsenic in pyrite from the Lerhamn drill core is done using LA-ICP-MS, for high precision and accurate results. A second drill core (Fågelsång-3) retrieved from Ordovician shales in the Fågelsång area, south-west Scania, is also investigated for a comparison of the result.

Conclusions
The Lerhamn and Fågelsång-3 drill cores are dominated by grey to black Ordovician shales. Carbonates in the shale units are largely restricted to fractures. Pyrite of varying size are common throughout the entire succession in both drill cores.

The analytical results show high concentrations of arsenic and some of the heavy metals (V, Cr, Co, Mo, Cd, Sb, W, Hg, Pb), in both drill cores. However, a single significant As-anomaly is only observed in the Lerhamn drill core peaking at around 40 m depth (Fig. 1). The average arsenic concentration is approximately 736 ppm in the Lerhamn drill core and 268 ppm in the Fågelsång-3 drill core, with highest values ranging up to 17660 ppm and 2295 ppm, respectively.

Fig. 1. Diagram showing arsenic concentrations in pyrite from the Lerhamn drill core. Highest concentration measures 17660 ppm and lowest 0.04 ppm (Excluded points: 17660 ppm, 6129 ppm and 5504 ppm).

Method
Pyrite was extracted from two drill cores, the Lerhamn and the Fågelsång-3 drill cores. A total of 388 samples (269 from Lerhamn and 119 from Fågelsång-3) were extracted for analysis. The analysis was done using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS).

Results
The analytical results from the LA-ICP-MS confirm high concentrations of arsenic, including some of the heavy metals (V, Cr, Co, Mo, Cd, Sb, W, Hg, Pb), in both drill cores. However, a single significant As-anomaly is only observed in the Lerhamn drill core peaking at around 40 m depth (Fig. 1). The average arsenic concentration is approximately 736 ppm in the Lerhamn drill core and 268 ppm in the Fågelsång-3 drill core, with highest values ranging up to 17660 ppm and 2295 ppm, respectively.

Compliance
The Lerhamn and Fågelsång-3 drill cores are dominated by grey to black Ordovician shales. Carbonates in the shale units are largely restricted to fractures. Pyrite of varying size are common throughout the entire succession in both drill cores.

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