**Fig. SM1** - NMDS biplot for the measured soil parameters with the superimposition of the confidence ellipses with $\alpha = 0.05$. "+" and circles represent variables and objects, respectively.
Fig. SM2 - Scatter plot of the predicted vs. measured values of each studied parameter for the PLSR models using the $x_i$ vectors (black) and the $d_i$ vectors (grey). Dashed lines show the linear fit of both the point clouds. Units for the axes are the same as in Table 3.
**Fig. SM3** - Scatter plot of the predicted vs. measured values of each studied parameter for the SPC/LASSO models using the $\mathbf{x}_i$ vectors (black) and the $\mathbf{d}_i$ vectors (grey). Dashed lines show the linear fit of both the point clouds. Units for the axes are the same as in Table 3.
Fig. SM4 - Scatter plot of the predicted vs. measured values of each studied parameter for the Elastic net models using the $x_i$ vectors (black) and the $d_i$ vectors (grey). Dashed lines show the linear fit of both the point clouds. Units for the axes are the same as in Table 3.