**METADATA Description for SDMP.FY22.176**

**Tables and Figures**

Table 1. Studies included in the primary group with the number of soils, non-control treatments and total number of samples in each study.

|  |  |  |  |
| --- | --- | --- | --- |
| Reference | soils  | treatments |  samples |
| Basta et al. (2001)\* | 1 | 1 | 6 |
| Hettiarachchi et al. (2001)\* | 5 | 5 | 84 |
| Yang et al. (2001) | 1 | 3 | 12 |
| Geebelen et al. (2003) | 10 | 1 | 60 |
| Tang et al. (2004) | 1 | 8 | 27 |
| Brown et al. (2005)\* | 2 | 3 | 15 |
| Codling (2007) | 2 | 1 | 12 |
| Yoon et al. (2007) | 2 | 5 | 36 |
| Cao et al. (2008) | 2 | 3 | 24 |
| Kilgour et al. (2008) | 1 | 3 | 8 |
| Zupančič et al. (2012) | 1 | 6 | 21 |
| Beyer et al. (2016) | 1 | 1 | 18 |
| Obrycki et al. (2016) | 2 | 2 | 84 |
| Sanderson et al. (2016)\* | 4 | 2 | 36 |
| Obrycki et al. (2017)\* | 1 | 1 | 6 |
| Gu et al. (2020) | 2 | 6 | 56 |
| Alasmary (2020) | 2 | 19 | 63 |

\*Corresponding authors provided additional information



Figure 1. Flowchart of literature search and eligible records in this meta-analysis

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**A**

**B**

Figure 2. Distribution of A) absolute change in IVBA Pb (%) and B) relative change in IVBA Pb (%) for soils in each analysis group.

Table 2. Summary of pooled treatment effect via random effects model for each analysis group. I2 is percentage of difference due real differences, and t is the between study standard deviation. The value of t is in the same units as the treatment effects.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group | n | Absolute change  |  | Relative change  |
| I2 | t | p-value | Average | 95% confidence interval |  | I2 | t | p-value | Average | 95% confidence interval |
| Primary | 40 | 98.6% | 12.2% | <0.05 | -11.4% | [-15.4% ,-7.4%] |  | 95.7% | 15.4% | <0.05 | -21.4% | [-26.7% , -16.1%] |
| Secondary | 36 | 96.7% | 16.4% | <0.05 | -15.6% | [-21.4% ,-9.7%] |  | 94.3% | 22.4% | <0.05 | -32.3% | [-40.5%, -24.2%] |
| Secondary (no field studies) | 28 | 96.9% | 15.6% | <0.05 | -12.4% | [-18.7% , -6.1%] |  | 94.7% | 20.2% | <0.05 | -27.2% | [-35.4%, -18.9%] |
| Secondary (only field studies) | 8 | 88.4% | 15.0% | <0.05 | -28.5% | [-41.8%, -15.2%] |  | 87.4% | 22.9% | <0.05 | -53.6% | [-74.4%,-32.9%] |
| EPA Method 1340 | 23 | 98.6% | 11.4% | <0.05 | -5.6% | [-10.7% ,-0.6%] |  | 98.0% | 17.2% | <0.05 | -8.3% | [-16.4%, -0.8%] |



Figure 3. Fully random effects forest plot for AC and RC grouped by contaminant source. Squares represent the mean difference for a soil and error bars are 95% CI. Diamonds represent the 95% CI of the mean difference between the control and treated soil for each subgroup and the overall treatment effect.



Figure 4. Fully random effects forest plot for AC and RC by amendment type. Squares represent average treatment effect for each subgroup with error bars denoting the 95% CI. Diamonds represent the 95% CI of the overall treatment effects.



Figure 5. Fully random effects forest plot for AC and RC by acid factor. Squares represent average treatment effect for each subgroup with error bars denoting the 95% CI. Diamonds represent the 95% CI of the overall treatment effects.



R2 **=**31%

R2 **=**26%

**E**

R2= 10%

**B**

R2 =41%

**D**

R2 = 27%

**A**

R2 =12%

Weight (%)-AC1.252.5 RC1.2 2 2.6

**F**

**C**

Figure 6. Single linear meta-regression for AC by A) incubated pH, B) control IVBA Pb, and C) total Pb and RC by D) incubated pH, E) control IVBA Pb, and F) total Pb



Figure 7. Random effects forest plot of AC and RC for soils from Jasper County, MO. Squares represent the mean difference for a soil and error bars are 95% CI. Diamonds represent the 95% CI for summary treatment effects.

Column fittings for figures and tables -Table 1.- 1.5, Table 2.- 1., Figure 1.- 1, Figure 2.- 2, Figure 3.- 2, Figure 4.- 1, Figure 5.- 1, Figure 6.- 2, Figure 7.- 2

Table S1. Summary of references included in each analysis group

|  |  |
| --- | --- |
| Reference | Analysis group |
| Alasmary 2020 | Primary  |
| Barth et al. 2005 | EPA Method 1340 |
| Basta et al. 2001 | Primary  |
| Beyer et al. 2016 | Primary  |
| Beyer et al. 2016 | Secondary |
| Beyer et al. 2016 | EPA Method 1340 |
| Bosso et al. 2008 | Excluded |
| Brown et al. 2005 | Primary |
| Brown et al. 2005 | Secondary  |
| Brown et al. 2007 | Secondary |
| Cai et al. 2017 | Secondary |
| Cao et al. 2009 | Primary  |
| Codling 2007 | Primary  |
| Cui et al. 2010 | Secondary |
| Cui et al. 2017 | Secondary |
| Geebelen et al. 2003 | Primary  |
| Gu et al. 2020 | Primary  |
| He et al. 2013 | Secondary |
| Hettiarachchi and Pierzynski 2002 | Secondary |
| Hettiarachchi et al. 2000 | Secondary |
| Hettiarachchi et al. 2001 | Primary  |
| Hettiarachchi et al. 2001 | Secondary |
| Juhasz et al. 2016 | Secondary |
| Juhasz et al. 2016 | EPA Method 1340 |
| Kastury et al. 2019a | EPA Method 1340 |
| Kastury et al. 2019b | EPA Method 1340 |
| Kilgour et al. 2008 | Primary  |
| Li et al. 2017 | Secondary |
| Li et al. 2017 | EPA Method 1340 |
| Madrid et al. 2008 | EPA Method 1340 |
| Mele et al. 2015 | EPA Method 1340 |
| Moseley et al. 2008 | Secondary |
| Moseley et al. 2008 | EPA Method 1340 |
| Obrycki et al. 2016 | Primary  |
| Obrycki et al. 2016 | EPA Method 1340 |
| Obrycki et al. 2017 | Primary  |
| Park et al. 2011 | EPA Method 1340 |
| Rizwan, et al. 2016 | EPA Method 1340 |
| Sanderson et al. 2016 | Primary  |
| Scheckel et al. 2005 | Secondary |
| Scheckel et al. 2005 | EPA Method 1340 |
| Schwab et al. 2006 | EPA Method 1340 |
| Seshadri et al. 2017 | EPA Method 1340 |
| Sharma, et al. 2011 | Secondary |
| Sonmez and Pierzynski 2005 | Secondary |
| Tang and Yang 2012 | Secondary |
| Tang et al. 2009 | Secondary |
| Tang et al. 2004 | Primary  |
| Yang and Mosby 2006 | Secondary |
| Yang et al. 2001 | Primary  |
| Yang et al. 2002 | Secondary |
| Yoon et al. 2007 | Primary  |
| Zupančič et al. 2012 | Primary |