

## Electronic Supplementary Information

### Preliminary Studies for the Standardization of a pXRF Analyzer via ICP-OES for Pb in New Paint

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**Table S1.** pXRF and ICP-OES Pb in paint concentrations. Samples with RSDs exceeding 5% are noted. Samples exceeding the 90 ppm [Pb] recommended limit for lead in new paint are found in **red text**.<sup>1</sup> \*SE = synthetic enamel, QDIE = quick drying industrial enamel, SEG = synthetic enamel gloss, PE = paint enamel, PMG = paint metal enamel, GL = gloss, AR anti-rust, CB = chalkboard paint, E = enamel, AG = arbo gloss. <sup>a</sup> Limited sample was available, and the sample thickness was under 14 mm in the sample cup. <sup>b</sup> This sample has an RSD of 124%, and as such was omitted from the regression analysis.

| Sample          | pXRF<br>[Pb] ± SD (ppm) | ICP-OES<br>[Pb] ± SD (ppm) | Origin  | Color  | Paint<br>Type<br>* |
|-----------------|-------------------------|----------------------------|---------|--------|--------------------|
| 1               | <LOD                    | <LOD                       | China   | White  | SE                 |
| 2               | 1528 ± 25               | 1818 ± 183                 | China   | Blue   | SE                 |
| 3               | 191629 ± 8960           | 236163 ± 14685             | China   | Yellow | SE                 |
| 4               | 91614 ± 4315            | 109264 ± 3559              | China   | Green  | SE                 |
| 5               | 35107 ± 720             | 41501 ± 607                | China   | Brown  | SE                 |
| 6               | <LOD                    | <LOD                       | Guyana  | Green  | AG                 |
| 7               | <LOD                    | <LOD                       | Guyana  | Red    | AG                 |
| 8               | 14316 ± 628             | 15684 ± 1470               | Guyana  | Brown  | AG                 |
| 9               | <LOD                    | <LOD                       | Guyana  | White  | AG                 |
| 10              | 32918 ± 76              | 37863 ± 1161               | Guyana  | Yellow | AG                 |
| 11              | 70 ± 4                  | 76.40 ± 2.07               | China   | Red    | SE                 |
| 12              | 169680 ± 2687           | 221277 ± 1881              | China   | Yellow | SE                 |
| 13              | 99669 ± 1275            | 134016 ± 3609              | China   | Green  | SE                 |
| 14              | 41 ± 3                  | 52.28 ± 1.80               | China   | Blue   | SE                 |
| 15              | 156 ± 5                 | 176 ± 2                    | China   | Blue   | SE                 |
| 16              | 1344 ± 15               | 1543 ± 13                  | China   | Cream  | SE                 |
| 17              | 8 ± 2                   | 13.9 ± 0.3                 | China   | White  | SE                 |
| 18              | 43785 ± 450             | 56537 ± 599                | China   | Brown  | SE                 |
| 19              | 2280 ± 20               | 2680 ± 6                   | China   | Black  | SE                 |
| 20              | 27 ± 2                  | 13.3 ± 0.3                 | Jamaica | Red    | QDIE               |
| 21 <sup>a</sup> | <LOD                    | <LOD                       | Jamaica | Green  | QDIE               |
| 22              | 43 ± 2                  | 30.6 ± 0.5                 | Jamaica | Gold   | QDIE               |
| 23 <sup>a</sup> | 39 ± 2                  | 31.4 ± 0.2                 | Jamaica | White  | QDIE               |
| 24 <sup>a</sup> | 4 ± 2                   | <LOD                       | Jamaica | Black  | QDIE               |
| 25              | <LOD                    | <LOD                       | Jamaica | Brown  | PRM                |
| 26              | 1115 ± 15               | 1306 ± 8                   | China   | Red    | SEG                |
| 27              | 46837 ± 521             | 57495 ± 815                | China   | Yellow | SEG                |

|    |             |                          |         |        |     |
|----|-------------|--------------------------|---------|--------|-----|
| 28 | 41459 ± 405 | 56524 ± 1584             | China   | Yellow | PE  |
| 29 | 29194 ± 282 | 35692 ± 615              | China   | Green  | SEG |
| 30 | 1216 ± 16   | 1304 ± 14                | China   | Blue   | SEG |
| 31 | 1132 ± 16   | 1204 ± 9                 | China   | White  | SEG |
| 32 | 14 ± 2      | <LOD                     | Unknown | White  | PME |
| 33 | <LOD        | <LOD                     | Guyana  | Red    | GL  |
| 34 | <LOD        | <LOD                     | Guyana  | Red    | GL  |
| 35 | <LOD        | <LOD                     | Guyana  | Red    | GL  |
| 36 | <LOD        | <LOD                     | Guyana  | Red    | GL  |
| 37 | <LOD        | <LOD                     | Guyana  | Red    | GL  |
| 38 | 24054 ± 213 | 29500 ± 77               | Guyana  | Yellow | GL  |
| 39 | <LOD        | <LOD                     | Guyana  | Yellow | GL  |
| 40 | <LOD        | <LOD                     | Guyana  | Yellow | GL  |
| 41 | <LOD        | <LOD                     | Guyana  | Green  | GL  |
| 42 | <LOD        | <LOD                     | Guyana  | Green  | GL  |
| 43 | <LOD        | <LOD                     | Guyana  | Green  | GL  |
| 44 | <LOD        | <LOD                     | Guyana  | Green  | GL  |
| 45 | <LOD        | <LOD                     | Guyana  | Blue   | GL  |
| 46 | <LOD        | <LOD                     | Guyana  | Blue   | GL  |
| 47 | <LOD        | <LOD                     | Guyana  | Blue   | GL  |
| 48 | <LOD        | <LOD                     | Guyana  | Blue   | GL  |
| 49 | <LOD        | <LOD                     | Guyana  | Purple | GL  |
| 50 | <LOD        | <LOD                     | Guyana  | Pink   | GL  |
| 51 | <LOD        | <LOD                     | Guyana  | Cream  | GL  |
| 52 | 10733 ± 92  | 13732 ± 248              | Guyana  | Brown  | GL  |
| 53 | <LOD        | <LOD                     | Guyana  | Brown  | GL  |
| 54 | <LOD        | <LOD                     | Guyana  | Red    | AR  |
| 55 | <LOD        | <LOD                     | Guyana  | Red    | AR  |
| 56 | 29 ± 3      | <LOD                     | Guyana  | Green  | AR  |
| 57 | <LOD        | <LOD                     | Guyana  | White  | AR  |
| 58 | 22 ± 4      | 0.77 ± 1.16 <sup>b</sup> | Guyana  | Black  | AR  |
| 59 | <LOD        | <LOD                     | Guyana  | Black  | CB  |
| 60 | 42167 ± 391 | 55206 ± 683              | Guyana  | Red    | E   |

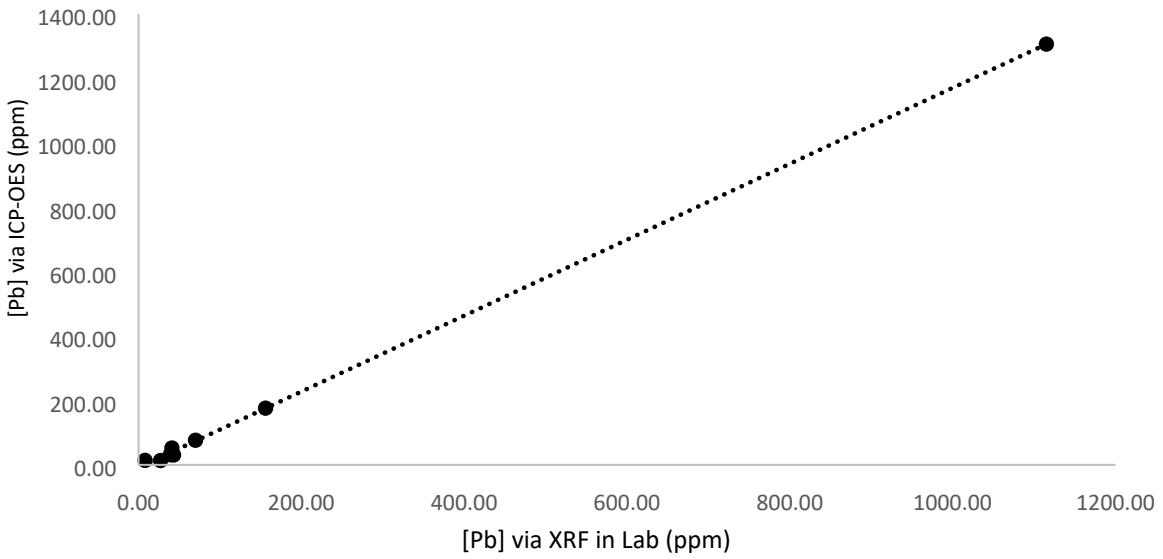


Figure S1. Lower-end Calibration Curve: 8-1115 ppm via pXRF

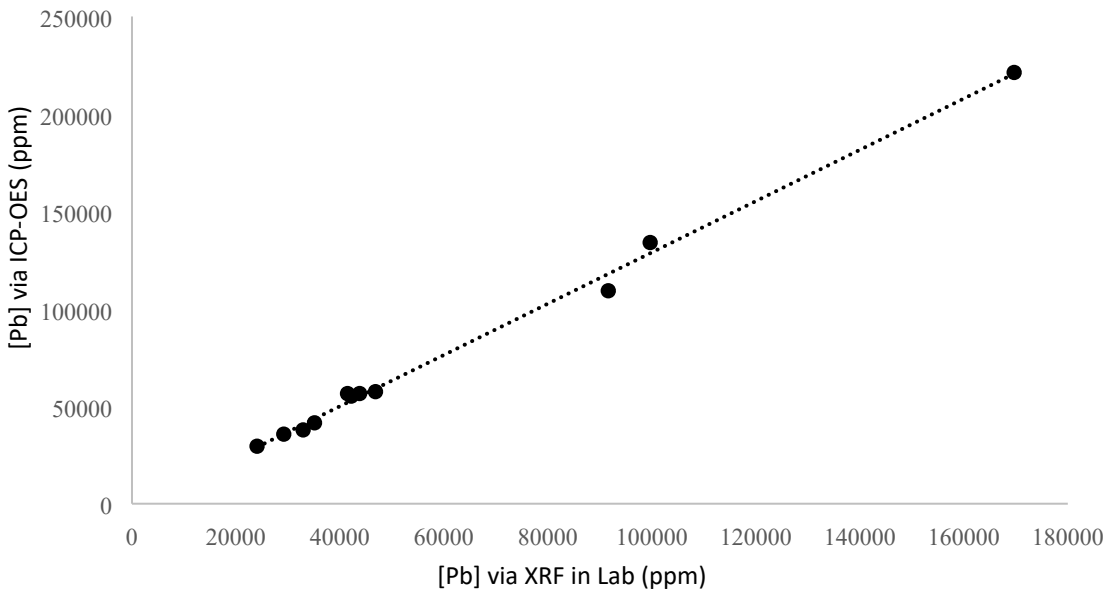


Figure S2. High-end Calibration Curve: 24054-169680 ppm via pXRF

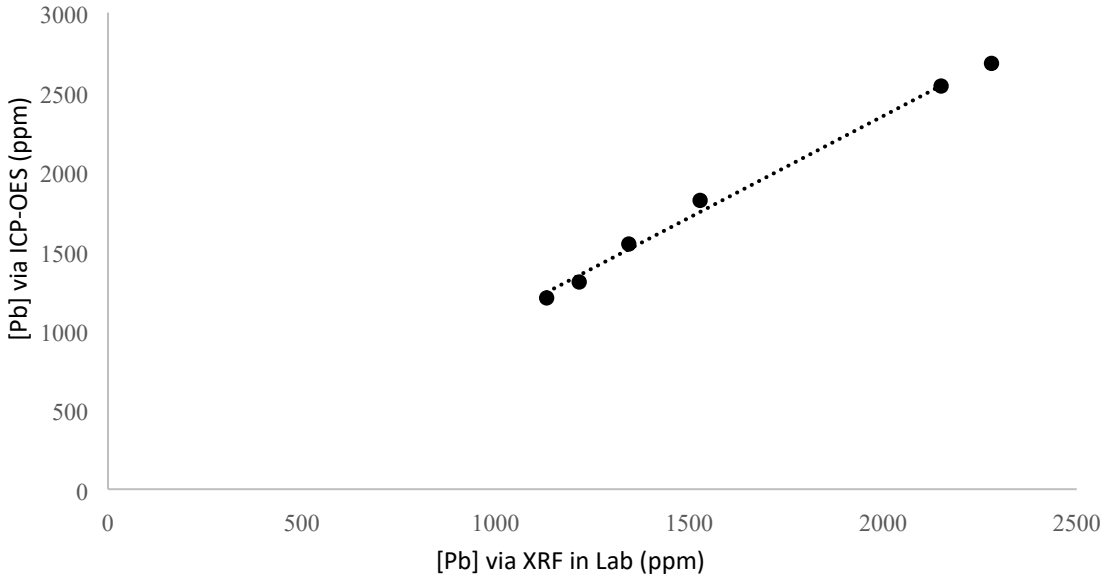


Figure S3. Middle Calibration Curve: 1132-2150 ppm via pXRF

### References

- (1) Environment, U. N. *Model Law and Guidance for Regulating Lead Paint* | UNEP - UN Environment Programme. <https://www.unep.org/resources/publication/model-law-and-guidance-regulating-lead-paint> (accessed 2024-11-10).