

# Gegenüberstellung Schadstoffgehalte

## - Zuordnungswerte Z 0 bis Z 2 nach LAGA-Boden 2004 -

| Hauptbodenart                  | Sand  | Sand  | Lehm/Schluff | Sand  |          |                  |         |      |      |
|--------------------------------|-------|-------|--------------|-------|----------|------------------|---------|------|------|
| Feststoff                      | MP 1  | MP 2  | MP 4         | MP 5  | Z 0 Sand | Z 0 Lehm/Schluff | Z 0 Ton | Z 1  | Z 2  |
| TOC [M.-%]                     | 1,00  | 0,20  | 0,70         | 0,10  | 0,5      | 0,5              | 0,5     | 1,5  | 5    |
| EOX [mg/kg TS]                 | n.n.  | n.n.  | n.n.         | n.n.  | 1        | 1                | 1       | 3    | 10   |
| KW (C10-C22) [mg/kg TS]        | n.n.  | n.n.  | n.n.         | n.n.  | 100      | 100              | 100     | 300  | 1000 |
| Σ BTEX [mg/kg TS]              | n.n.  | n.n.  | n.n.         | n.n.  | 1        | 1                | 1       | 1    | 1    |
| Σ LHKW [mg/kg TS]              | n.n.  | n.n.  | n.n.         | n.n.  | 1        | 1                | 1       | 1    | 1    |
| Σ PAK <sub>16</sub> [mg/kg TS] | 1,10  | n.n.  | n.n.         | n.n.  | 3        | 3                | 3       | 3    | 30   |
| Benzo(a)pyren [mg/kg TS]       | 0,11  | n.n.  | 0,06         | n.n.  | 0,3      | 0,3              | 0,3     | 0,9  | 3    |
| Σ PCB <sub>6</sub> [mg/kg TS]  | n.n.  | n.n.  | n.n.         | n.n.  | 0,05     | 0,05             | 0,05    | 0,15 | 0,5  |
| Arsen [mg/kg TS]               | 5,10  | 2,30  | 6,10         | 2,70  | 10       | 15               | 20      | 45   | 150  |
| Blei [mg/kg TS]                | 30,00 | 6,40  | 15,00        | 3,10  | 40       | 70               | 100     | 210  | 700  |
| Cadmium [mg/kg TS]             | 0,29  | n.n.  | 0,12         | n.n.  | 0,4      | 1                | 1,5     | 3    | 10   |
| Chrom [mg/kg TS]               | 12,00 | 7,20  | 19,00        | 4,00  | 30       | 60               | 100     | 180  | 600  |
| Kupfer [mg/kg TS]              | 25,00 | 15,00 | 26,00        | 7,60  | 20       | 40               | 60      | 120  | 400  |
| Nickel [mg/kg TS]              | 8,70  | 10,00 | 21,00        | 4,40  | 15       | 50               | 70      | 150  | 500  |
| Quecksilber [mg/kg TS]         | 0,12  | n.n.  | n.n.         | n.n.  | 0,1      | 0,5              | 1       | 1,5  | 5    |
| Thallium [mg/kg TS]            | n.n.  | n.n.  | n.n.         | n.n.  | 0,4      | 0,7              | 1       | 2,1  | 7    |
| Zink [mg/kg TS]                | 67,00 | 32,00 | 50,00        | 16,00 | 60       | 150              | 200     | 450  | 1500 |
| Cyanid (ges.) [mg/kg TS]       | n.n.  | n.n.  | n.n.         | n.n.  | -        | -                | -       | 3    | 10   |

| Eluat                 | MP 1   | MP 2  | MP 4   | MP 5  | Z 0       | Z 1.1     | Z 1.2    | Z 2      |
|-----------------------|--------|-------|--------|-------|-----------|-----------|----------|----------|
| pH-Wert [-]           | 7,80   | 9,30  | 8,30   | 7,80  | 6,5 - 9,5 | 6,5 - 9,5 | 6,0 - 12 | 5,5 - 12 |
| Leitfähigkeit [µS/cm] | 150,00 | 70,40 | 116,00 | 54,90 | 250       | 250       | 1500     | 2000     |
| Chlorid [mg/l]        | 0,80   | n.n.  | 1,30   | n.n.  | 30        | 30        | 50       | 100      |
| Sulfat [mg/l]         | 12,00  | 9,70  | 2,40   | 1,10  | 20        | 20        | 50       | 200      |
| Cyanid [µg/l]         | n.n.   | n.n.  | n.n.   | n.n.  | 5         | 5         | 10       | 20       |
| Phenolindex [µg/l]    | n.n.   | n.n.  | n.n.   | n.n.  | 20        | 20        | 40       | 100      |
| Arsen [µg/l]          | 3,30   | 3,40  | 0,95   | 1,30  | 14        | 14        | 20       | 60       |
| Blei [µg/l]           | n.n.   | n.n.  | n.n.   | n.n.  | 40        | 40        | 80       | 200      |
| Cadmium [µg/l]        | n.n.   | n.n.  | n.n.   | n.n.  | 1,5       | 1,5       | 3        | 6        |
| Chrom ges. [µg/l]     | 1,30   | 2,10  | n.n.   | n.n.  | 12,5      | 12,5      | 25       | 60       |
| Kupfer [µg/l]         | 2,90   | 1,30  | 1,50   | n.n.  | 20        | 20        | 60       | 100      |
| Nickel [µg/l]         | n.n.   | n.n.  | n.n.   | n.n.  | 15        | 15        | 20       | 70       |
| Quecksilber [µg/l]    | n.n.   | n.n.  | n.n.   | n.n.  | 0,5       | 0,5       | 1        | 2        |
| Zink [µg/l]           | n.n.   | n.n.  | n.n.   | n.n.  | 150       | 150       | 200      | 600      |

| Probenbezeichnung | MP 1  | MP 2 | MP 4 | MP 5 |
|-------------------|-------|------|------|------|
| Einbauklasse      | Z 1.1 | Z 0  | Z 0  | Z 0  |

|                                                                                                                                                                                                                                       |                                                               |  |                     |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--|---------------------|--|
|  <b>PTM - Geotechnik Arnsberg GmbH</b><br><br>Obereimer 38, 59821 Arnsberg<br>Tel.: 02931/89 03 0<br>Fax: 02931/89 03 22<br>Mail: arnsberg@ptm.net | <b>Projekt:</b>                                               |  | <b>Anlage :</b>     |  |
|                                                                                                                                                                                                                                       | Neubau eines Rathauses<br>mit Tiefgarage<br>in 33129 Delbrück |  | 8.1.1               |  |
|                                                                                                                                                                                                                                       | <b>Auftraggeber:</b>                                          |  | <b>Projekt-Nr.:</b> |  |
|                                                                                                                                                                                                                                       | Stadt Delbrück<br>Marktstraße 6<br>33129 Delbrück             |  | 19-7422             |  |
|                                                                                                                                                                                                                                       |                                                               |  | <b>Datum:</b>       |  |
|                                                                                                                                                                                                                                       |                                                               |  | 12.09.2019          |  |

# Gegenüberstellung Schadstoffgehalte

## - Zuordnungswerte Z 0 bis Z 2 nach LAGA-Bauschutt 1997 -

| Feststoff                       | MP 3  | / | / | / | Z 0    | Z 1.1 | Z 1.2 | Z 2    |
|---------------------------------|-------|---|---|---|--------|-------|-------|--------|
| Arsen [mg/kg]                   | 2,90  |   |   |   | ≤ 20   | ≤ 30  | ≤ 50  | ≤ 150  |
| Blei [mg/kg]                    | 6,00  |   |   |   | ≤ 100  | ≤ 200 | ≤ 300 | ≤ 1000 |
| Cadmium [mg/kg]                 | n.n.  |   |   |   | ≤ 0,6  | ≤ 1   | ≤ 3   | ≤ 10   |
| Chrom [mg/kg]                   | 7,10  |   |   |   | ≤ 50   | ≤ 100 | ≤ 200 | ≤ 600  |
| Kupfer [mg/kg]                  | 14,00 |   |   |   | ≤ 40   | ≤ 100 | ≤ 200 | ≤ 600  |
| Nickel [mg/kg]                  | 8,30  |   |   |   | ≤ 40   | ≤ 100 | ≤ 200 | ≤ 600  |
| Quecksilber [mg/kg]             | n.n.  |   |   |   | ≤ 0,3  | ≤ 1   | ≤ 3   | ≤ 10   |
| Zink [mg/kg]                    | 36,00 |   |   |   | ≤ 120  | ≤ 300 | ≤ 500 | ≤ 1500 |
| KW <sub>(C10-C40)</sub> [mg/kg] | n.n.  |   |   |   | ≤ 100  | ≤ 300 | ≤ 500 | ≤ 1000 |
| Σ PAK <sub>16</sub> [mg/kg]     | n.n.  |   |   |   | ≤ 1    | ≤ 5   | ≤ 15  | ≤ 75   |
| EOX [mg/kg]                     | n.n.  |   |   |   | ≤ 1    | ≤ 3   | ≤ 5   | ≤ 10   |
| Σ PCB <sub>6</sub> [mg/kg]      | n.n.  |   |   |   | ≤ 0,02 | ≤ 0,1 | ≤ 0,5 | ≤ 1    |

| Eluat                 | MP 3   | / | / | / | Z 0        | Z 1.1  | Z 1.2  | Z 2    |
|-----------------------|--------|---|---|---|------------|--------|--------|--------|
| pH-Wert [-]           | 10,80  |   |   |   | 7,5 - 12,5 |        |        |        |
| Leitfähigkeit [µS/cm] | 200,00 |   |   |   | ≤ 500      | ≤ 1500 | ≤ 2500 | ≤ 3000 |
| Chlorid [mg/l]        | 1,90   |   |   |   | ≤ 10       | ≤ 20   | ≤ 40   | ≤ 150  |
| Sulfat [mg/l]         | 13,00  |   |   |   | ≤ 50       | ≤ 150  | ≤ 300  | ≤ 600  |
| Arsen [µg/l]          | n.n.   |   |   |   | ≤ 10       | ≤ 10   | ≤ 40   | ≤ 50   |
| Blei [µg/l]           | n.n.   |   |   |   | ≤ 20       | ≤ 40   | ≤ 100  | ≤ 100  |
| Cadmium [µg/l]        | n.n.   |   |   |   | ≤ 2        | ≤ 2    | ≤ 5    | ≤ 5    |
| Chrom gesamt [µg/l]   | 2,10   |   |   |   | ≤ 15       | ≤ 30   | ≤ 75   | ≤ 100  |
| Kupfer [µg/l]         | 3,90   |   |   |   | ≤ 50       | ≤ 50   | ≤ 150  | ≤ 200  |
| Nickel [µg/l]         | n.n.   |   |   |   | ≤ 40       | ≤ 50   | ≤ 100  | ≤ 100  |
| Quecksilber [µg/l]    | n.n.   |   |   |   | ≤ 0,2      | ≤ 0,2  | ≤ 1    | ≤ 2    |
| Zink [µg/l]           | n.n.   |   |   |   | ≤ 100      | ≤ 100  | ≤ 300  | ≤ 400  |
| Phenolindex [µg/l]    | n.n.   |   |   |   | ≤ 10       | ≤ 10   | ≤ 50   | ≤ 100  |

n.n. = nicht nachweisbar

| Probenbezeichnung | MP 3 | / | / | / |
|-------------------|------|---|---|---|
| Einbauklasse      | Z 0  |   |   |   |

|                                                                                                                                                                                                                                                     |                                                                                               |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------|
|  <p><b>PTM - Geotechnik<br/>Arnsberg GmbH</b></p> <p>Obereimer 38, 59821 Arnsberg<br/>Tel.: 02931/89 03 0<br/>Fax: 02931/89 03 22<br/>Mail: arnsberg@ptm.net</p> | <p><b>Projekt:</b></p> <p>Neubau eines Rathauses<br/>mit Tiefgarage<br/>in 33129 Delbrück</p> | <p><b>Anlage :</b></p> <p>8.1.2</p>       |
|                                                                                                                                                                                                                                                     | <p><b>Auftraggeber:</b></p> <p>Stadt Delbrück<br/>Marktstraße 6<br/>33129 Delbrück</p>        | <p><b>Projekt-Nr.:</b></p> <p>19-7422</p> |
|                                                                                                                                                                                                                                                     |                                                                                               | <p><b>Datum:</b></p> <p>16.08.2019</p>    |

# Gegenüberstellung Schadstoffgehalte

## Zuordnungswerte DK 0 bis DK III nach Deponieverordnung Stand Mai 2013

| Feststoff                                      | MP 1 | MP 2 | MP 4 | MP 5 | DK 0 | DK I | DK II | DK III |
|------------------------------------------------|------|------|------|------|------|------|-------|--------|
| Σ BTEX [mg/kg]                                 | n.n. | n.n. | n.n. | n.n. | 6    |      |       |        |
| Σ PCB <sub>7</sub> [mg/kg]                     | n.n. | n.n. | n.n. | n.n. | 1    |      |       |        |
| Glühverlust [M-%]                              | 3,00 | 1,00 | 2,50 | 0,50 | 3    | 3    | 5     | 10     |
| TOC [M-%]                                      | 1,00 | 0,20 | 0,70 | 0,10 | 1    | 1    | 3     | 6      |
| lipophile Stoffe [M-%]                         | 0,05 | n.n. | n.n. | n.n. | 0,1  | 0,4  | 0,8   | 4      |
| KW (C <sub>10</sub> -C <sub>40</sub> ) [mg/kg] | n.n. | n.n. | n.n. | n.n. | 500  |      |       |        |
| Σ PAK (EPA) [mg/kg]                            | 1,10 | n.n. | n.n. | n.n. | 30   |      |       |        |
| ROC [M-%] TM                                   | 0,40 | -    | -    | -    |      |      |       |        |
| AT <sub>4</sub> [mg O <sub>2</sub> /g]         | -    | -    | -    | -    | 5    | 5    | 5     | 5      |
| GB <sub>21</sub> [NI/kg]                       | -    | -    | -    | -    | 15   | 15   | 15    | 15     |
| Brennwert Ho [kJ/kg]                           | -    | -    | -    | -    | 6000 | 6000 | 6000  | 6000   |

| DEV-S4-Eluat          | MP 1   | MP 2  | MP 4  | MP 5  | DK 0     | DK I     | DK II    | DK III   |
|-----------------------|--------|-------|-------|-------|----------|----------|----------|----------|
| pH-Wert [-]           | 7,80   | 9,30  | 8,30  | 7,80  | 5,5 - 13 | 5,5 - 13 | 5,5 - 13 | 4,0 - 13 |
| DOC [mg/l]            | 2,70   | n.n.  | 1,80  | n.n.  | 50       | 50       | 80       | 100      |
| Phenole [mg/l]        | n.n.   | n.n.  | n.n.  | n.n.  | 0,1      | 0,2      | 50       | 100      |
| Fluorid [mg/l]        | 0,32   | 0,17  | 0,54  | 0,19  | 1        | 5        | 15       | 50       |
| Chlorid [mg/l]        | 0,80   | n.n.  | 1,30  | n.n.  | 80       | 1500     | 1500     | 2500     |
| Sulfat [mg/l]         | 12,00  | 9,70  | 2,40  | 1,10  | 100      | 2000     | 2000     | 5000     |
| gelöste Stoffe [mg/l] | 104,00 | 44,00 | 80,00 | 20,00 | 400      | 3000     | 6000     | 10000    |
| Cyanid, l.fr. [mg/l]  | n.n.   | n.n.  | n.n.  | n.n.  | 0,01     | 0,1      | 0,5      | 1        |
| Antimon [µg/l]        | n.n.   | n.n.  | n.n.  | n.n.  | 6        | 30       | 70       | 500      |
| Arsen [µg/l]          | 3,30   | 3,40  | 0,95  | 1,30  | 50       | 200      | 200      | 2500     |
| Barium [µg/l]         | 5,00   | 8,00  | 5,50  | 2,00  | 2000     | 5000     | 10000    | 30000    |
| Blei [µg/l]           | n.n.   | n.n.  | n.n.  | n.n.  | 50       | 200      | 1000     | 5000     |
| Cadmium [µg/l]        | n.n.   | n.n.  | n.n.  | n.n.  | 4        | 50       | 100      | 500      |
| Chrom gesamt [µg/l]   | 1,30   | 2,10  | n.n.  | n.n.  | 50       | 300      | 1000     | 7000     |
| Kupfer [µg/l]         | 2,90   | 1,30  | 1,50  | n.n.  | 200      | 1000     | 5000     | 10000    |
| Molybdän [µg/l]       | 1,90   | n.n.  | 3,40  | 1,30  | 50       | 300      | 1000     | 3000     |
| Nickel [µg/l]         | n.n.   | n.n.  | n.n.  | n.n.  | 40       | 200      | 1000     | 4000     |
| Quecksilber [µg/l]    | n.n.   | n.n.  | n.n.  | n.n.  | 1        | 5        | 20       | 200      |
| Selen [µg/l]          | n.n.   | n.n.  | n.n.  | n.n.  | 10       | 30       | 50       | 700      |
| Zink [µg/l]           | n.n.   | n.n.  | n.n.  | n.n.  | 400      | 2000     | 5000     | 20000    |

n.n. = nicht nachweisbar ; n.u. = nicht untersucht

| Probenbezeichnung | MP 1     | MP 2     | MP 4     | MP 5     |
|-------------------|----------|----------|----------|----------|
| Deponieklasse     | DK 0*    | DK 0     | DK 0     | DK 0     |
| Abfallschlüssel:  | 17 05 04 | 17 05 04 | 17 05 04 | 17 05 04 |

\*Ausnahmeregelung siehe nachfolgende Anlagenseite

|                                                                                                                                                                                                                                          |                                                         |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------|
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|                                                                                                                                                                                                                                          | Neubau eines Rathauses mit Tiefgarage in 33129 Delbrück | 8.2.1               |
|                                                                                                                                                                                                                                          | <b>Auftraggeber:</b>                                    | <b>Projekt-Nr.:</b> |
|                                                                                                                                                                                                                                          | Stadt Delbrück<br>Marktstraße 6<br>33129 Delbrück       | 19-7422             |
|                                                                                                                                                                                                                                          |                                                         | <b>Datum:</b>       |
|                                                                                                                                                                                                                                          |                                                         | 16.08.2019          |

**Zusätzliche Erläuterungen zu den ermittelten Schadstoffgehalten  
nach Deponieverordnung Stand Mai 2013**

[illegible]

# Gegenüberstellung Schadstoffgehalte

## Zuordnungswerte DK 0 bis DK III nach Deponieverordnung Stand Mai 2013

| Feststoff                                      | MP 3 |  |  |  | DK 0 | DK I | DK II | DK III |
|------------------------------------------------|------|--|--|--|------|------|-------|--------|
| Σ BTEX [mg/kg]                                 | n.n. |  |  |  | 6    |      |       |        |
| Σ PCB <sub>7</sub> [mg/kg]                     | n.n. |  |  |  | 1    |      |       |        |
| Glühverlust [M-%]                              | 1,20 |  |  |  | 3    | 3    | 5     | 10     |
| TOC [M-%]                                      | 0,20 |  |  |  | 1    | 1    | 3     | 6      |
| lipophile Stoffe [M-%]                         | 0,07 |  |  |  | 0,1  | 0,4  | 0,8   | 4      |
| KW (C <sub>10</sub> -C <sub>40</sub> ) [mg/kg] | n.n. |  |  |  | 500  |      |       |        |
| Σ PAK (EPA) [mg/kg]                            | n.n. |  |  |  | 30   |      |       |        |
| ROC [M-%] TM                                   | -    |  |  |  |      |      |       |        |
| AT <sub>4</sub> [mg O <sub>2</sub> /g]         | -    |  |  |  | 5    | 5    | 5     | 5      |
| GB <sub>21</sub> [NI/kg]                       | -    |  |  |  | 15   | 15   | 15    | 15     |
| Brennwert Ho [kJ/kg]                           | -    |  |  |  | 6000 | 6000 | 6000  | 6000   |

| DEV-S4-Eluat          | MP 3   |  |  |  | DK 0     | DK I     | DK II    | DK III   |
|-----------------------|--------|--|--|--|----------|----------|----------|----------|
| pH-Wert [-]           | 10,80  |  |  |  | 5,5 - 13 | 5,5 - 13 | 5,5 - 13 | 4,0 - 13 |
| DOC [mg/l]            | 1,10   |  |  |  | 50       | 50       | 80       | 100      |
| Phenole [mg/l]        | n.n.   |  |  |  | 0,1      | 0,2      | 50       | 100      |
| Fluorid [mg/l]        | 0,29   |  |  |  | 1        | 5        | 15       | 50       |
| Chlorid [mg/l]        | 1,90   |  |  |  | 80       | 1500     | 1500     | 2500     |
| Sulfat [mg/l]         | 13,00  |  |  |  | 100      | 2000     | 2000     | 5000     |
| gelöste Stoffe [mg/l] | 134,00 |  |  |  | 400      | 3000     | 6000     | 10000    |
| Cyanid, l.fr. [mg/l]  | n.n.   |  |  |  | 0,01     | 0,1      | 0,5      | 1        |
| Antimon [μg/l]        | n.n.   |  |  |  | 6        | 30       | 70       | 500      |
| Arsen [μg/l]          | 3,40   |  |  |  | 50       | 200      | 200      | 2500     |
| Barium [μg/l]         | 9,30   |  |  |  | 2000     | 5000     | 10000    | 30000    |
| Blei [μg/l]           | n.n.   |  |  |  | 50       | 200      | 1000     | 5000     |
| Cadmium [μg/l]        | n.n.   |  |  |  | 4        | 50       | 100      | 500      |
| Chrom gesamt [μg/l]   | 2,10   |  |  |  | 50       | 300      | 1000     | 7000     |
| Kupfer [μg/l]         | 3,90   |  |  |  | 200      | 1000     | 5000     | 10000    |
| Molybdän [μg/l]       | 2,50   |  |  |  | 50       | 300      | 1000     | 3000     |
| Nickel [μg/l]         | n.n.   |  |  |  | 40       | 200      | 1000     | 4000     |
| Quecksilber [μg/l]    | n.n.   |  |  |  | 1        | 5        | 20       | 200      |
| Selen [μg/l]          | n.n.   |  |  |  | 10       | 30       | 50       | 700      |
| Zink [μg/l]           | n.n.   |  |  |  | 400      | 2000     | 5000     | 20000    |

n.n. = nicht nachweisbar ; n.u. = nicht untersucht

|                   |          |  |  |
|-------------------|----------|--|--|
| Probenbezeichnung | MP 3     |  |  |
| Deponieklasse     | DK 0     |  |  |
| Abfallschlüssel:  | 17 09 04 |  |  |

|                                                                                                                                                                                                                                          |                                                                                  |                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------|
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|                                                                                                                                                                                                                                          | <b>Auftraggeber:</b><br>Stadt Delbrück<br>Marktstraße 6<br>33129 Delbrück        | <b>Projekt-Nr.:</b><br>19-7422 |
|                                                                                                                                                                                                                                          |                                                                                  | <b>Datum:</b><br>16.08.2019    |