

Protecting Our Water Environment



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 08-31

***CALUMET EAST SOLIDS MANAGEMENT AREA
MONITORING REPORT FOR
FIRST QUARTER 2008***

JUNE 2008

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312-751-5600

Louis Kollias, P.E., BCEE
Director of Research and Development

June 5, 2008

312-751-5190

Mr. S. Alan Keller, P.R
Manager, Permit Section
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794 9276

Dear Mr. Keller:

Subject: Calumet East Solids Management Area - Calumet WRP, Contract No. 85-273-2P L170401, IEPA Permit No. 2005-AO-4281-1, Monitoring Report for January, February, and March 2008

The attached four tables contain the monitoring data for the Calumet East Solids Management Area for January, February, and March 2008 as required by IEPA Operating Permit No. 2005-AO-4281-1. In a letter dated January 19, 2007, the IEPA granted permission to terminate the monitoring of lysimeter L-1. Therefore, monitoring data for this lysimeter will not be included in this and subsequent reports.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on January 9, 2008

Table 2, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on February 20, 2008

Table 3, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East Solids Management Area Sampled on March 5, 2008

Table 4, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During January 2008

Mr. S. Alan Keller

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June 5, 2008

Subject: Calumet East Solids Management Area - Calumet WRP, Contract No. 85-273-2P, L170401, IEPA Permit No. 2005-AO-4281-1, Monitoring Report for January, February, and March 2008

No biosolids were placed in the solids drying area during January, February, and March 2008. Biosolids were removed from the solids drying area during January 2008.

Very truly yours,

Louis Kollias
Director
Research and Development

LK:PL:kq
Attachments

cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Stuba/Granato/Cox/Lindo/M. Patel

cc wo/att: Jamjun/Sharma/Conway

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON JANUARY 9, 2008

| Parameter | Unit | Lysimeter No. | | | | |
|--------------------------------------|------|---------------|---------|---------|---------|---------|
| | | L-1N | L-2 | L-3 | L-4 | L-5 |
| pH ¹ | | 7.8 | 7.8 | 7.8 | 7.4 | 7.8 |
| EC | mS/m | 348 | 346 | 171 | 195 | 161 |
| Total Dissolved Solids | mg/L | 3,886 | 4,072 | 1,808 | 4,170 | 1,612 |
| Total Diss. Org. Carbon | " | 8 | 5 | 6 | 2 | 1 |
| Cl ⁻ | " | 167 | 181 | 44 | 499 | 217 |
| SO ₄ ⁼ | " | 1,805 | 1,953 | 680 | 1,495 | 518 |
| TKN | " | 14 | 1.4 | 0.36 | 1.1 | 0.69 |
| NH ₃ -N | " | 3.8 | <0.04 | <0.02 | 0.61 | 0.44 |
| NO ₂ + NO ₃ -N | " | 0.07 | 0.18 | 0.08 | 0.14 | 0.19 |
| Total P | " | <0.05 | <0.10 | <0.05 | <0.05 | <0.05 |
| Alkalinity as CaCO ₃ | " | 530 | 464 | 488 | 365 | 243 |
| Al | " | 0.044 | 0.058 | 0.037 | 0.049 | 0.023 |
| Ca | " | 456 | 548 | 225 | 492 | 197 |
| Cd | " | <0.0004 | <0.0008 | 0.0005 | <0.0004 | <0.0004 |
| Cr | " | <0.0005 | <0.0010 | <0.0005 | <0.0005 | 0.0006 |
| Cu | " | <0.002 | <0.004 | <0.002 | <0.002 | <0.002 |
| Fe | " | 6.27 | 0.008 | 0.012 | 13.5 | 2.47 |
| Hg | μg/L | <0.05 | <0.10 | <0.05 | <0.05 | <0.05 |
| K | mg/L | 10 | 6 | 2 | 6 | 4 |
| Mg | " | 259 | 260 | 134 | 258 | 91.7 |
| Mn | " | 0.3961 | 0.0062 | 0.0008 | 0.1099 | 0.0499 |
| Na | " | 164 | 140 | 57 | 143 | 83 |
| Ni | " | <0.0004 | <0.0008 | <0.0004 | <0.0004 | <0.0004 |
| Pb | " | <0.004 | <0.008 | 0.005 | <0.004 | 0.005 |
| Zn | " | 0.008 | 0.045 | 0.017 | 0.011 | 0.009 |

TABLE 1 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON JANUARY 9, 2008

| Parameter | Unit | Lysimeter No. L-6 |
|--------------------------------------|------|----------------------|
| pH ¹ | | 7.9 |
| EC | mS/m | 127 |
| Total Dissolved Solids | mg/L | 1,372 |
| Total Diss. Org. Carbon | " | 1 |
| Cl ⁻ | " | 16 |
| SO ₄ ⁼ | " | 585 |
| TKN | " | 0.54 |
| NH ₃ -N | " | 0.24 |
| NO ₂ + NO ₃ -N | " | 0.31 |
| Total P | " | <0.05 |
| Alkalinity as CaCO ₃ | " | 274 |
| Al | " | 0.022 |
| Ca | " | 170 |
| Cd | " | <0.0004 |
| Cr | " | 0.0005 |
| Cu | " | <0.002 |
| Fe | " | 0.483 |
| Hg | μg/L | <0.05 |
| K | mg/L | 3 |
| Mg | " | 83.6 |
| Mn | " | 0.0317 |
| Na | " | 69 |
| Ni | " | <0.0004 |
| Pb | " | 0.004 |
| Zn | " | 0.006 |

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON FEBRUARY 20, 2008

| Parameter | Unit | Lysimeter No. | | | | |
|--------------------------------------|------|---------------|---------|---------|-----|-----|
| | | L-1N | L-2 | L-3 | L-4 | L-5 |
| pH ¹ | | 7.9 | 8.0 | 7.8 | | |
| EC | mS/m | 275 | 281 | 134 | | |
| Total Dissolved Solids | mg/L | 4,018 | 4,144 | 1,662 | | |
| Total Diss. Org. Carbon | " | 8 | 6 | 7 | | |
| Cl ⁻ | " | 191 | 199 | 48 | | |
| SO ₄ ⁼ | " | NA | NA | NA | | |
| TKN | " | 13 | 1.5 | 0.46 | L | L |
| NH ₃ -N | " | 3.4 | <0.02 | <0.02 | Y | Y |
| NO ₂ + NO ₃ -N | " | 0.05 | 0.15 | 0.08 | S | S |
| Total P | " | <0.05 | <0.05 | <0.05 | I | I |
| Alkalinity as CaCO ₃ | " | 536 | 485 | 500 | M | M |
| | | | | | E | E |
| Al | " | 0.054 | 0.058 | 0.032 | T | T |
| Ca | " | 484 | 575 | 218 | E | E |
| Cd | " | 0.0007 | 0.0009 | 0.0007 | R | R |
| Cr | " | <0.0005 | <0.0005 | <0.0005 | | |
| Cu | " | <0.002 | <0.002 | <0.002 | F | F |
| | | | | | R | R |
| | | | | | O | O |
| Fe | " | 8.12 | 0.023 | 0.024 | Z | Z |
| Hg | μg/L | <0.05 | <0.05 | <0.05 | E | E |
| K | mg/L | 11 | 7 | 2 | N | N |
| Mg | " | 280 | 266 | 132 | | |
| Mn | " | 0.2590 | 0.0069 | 0.0010 | | |
| | | | | | | |
| Na | " | 178 | 149 | 56 | | |
| Ni | " | <0.0004 | 0.0024 | 0.0006 | | |
| Pb | " | <0.004 | <0.004 | 0.005 | | |
| Zn | " | 0.021 | 0.038 | 0.017 | | |

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON FEBRUARY 20, 2008

| Parameter | Unit | Lysimeter No. L-6 |
|--------------------------------------|------|----------------------|
| pH ¹ | | 7.9 |
| EC | mS/m | 104 |
| Total Dissolved Solids | mg/L | 1,368 |
| Total Diss. Org. Carbon | " | 1 |
| Cl ⁻ | " | 19 |
| SO ₄ ⁼ | " | NA |
| TKN | " | 0.21 |
| NH ₃ -N | " | 0.13 |
| NO ₂ + NO ₃ -N | " | 0.32 |
| Total P | " | 0.05 |
| Alkalinity as CaCO ₃ | " | 278 |
| Al | " | 0.029 |
| Ca | " | 173 |
| Cd | " | <0.0004 |
| Cr | " | <0.0005 |
| Cu | " | <0.002 |
| Fe | " | 0.146 |
| Hg | μg/L | <0.05 |
| K | mg/L | 4 |
| Mg | " | 88.8 |
| Mn | " | 0.0301 |
| Na | " | 74 |
| Ni | " | <0.0004 |
| Pb | " | <0.004 |
| Zn | " | 0.004 |

¹pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON MARCH 5, 2008

| Parameter | Unit | Lysimeter No. | | | | |
|--------------------------------------|------|---------------|---------|---------|---------|---------|
| | | L-1N | L-2 | L-3 | L-4 | L-5 |
| pH ¹ | | 7.3 | 7.5 | 7.5 | 7.0 | 7.4 |
| EC | mS/m | 343 | 338 | 180 | 391 | 182 |
| Total Dissolved Solids | mg/L | 3,996 | NA | 1,680 | 3,880 | 1,464 |
| Total Diss. Org. Carbon | " | 8 | NA | 7 | 2 | 1 |
| Cl ⁻ | " | 183 | 190 | 47 | 523 | 224 |
| SO ₄ ⁼ | " | 1,983 | NA | 684 | 1,660 | 561 |
| TKN | " | 13 | 0.56 | 1.4 | 1.1 | 0.58 |
| NH ₃ -N | " | 2.8 | <0.04 | 0.21 | 0.58 | 0.38 |
| NO ₂ + NO ₃ -N | " | 0.04 | 0.11 | 0.04 | 0.11 | 0.17 |
| Total P | " | 0.10 | <0.10 | <0.05 | 0.05 | 0.06 |
| Alkalinity as CaCO ₃ | " | 563 | 480 | 500 | 360 | 241 |
| Al | " | 0.029 | 0.060 | 0.032 | 0.031 | 0.019 |
| Ca | " | 484 | 549 | 214 | 476 | 198 |
| Cd | " | 0.0006 | 0.0008 | <0.0004 | <0.0004 | <0.0004 |
| Cr | " | <0.0005 | <0.0010 | <0.0005 | <0.0005 | <0.0005 |
| Cu | " | <0.002 | <0.004 | <0.002 | <0.002 | <0.002 |
| Fe | " | 10.2 | 0.036 | 0.761 | 14.1 | 2.57 |
| Hg | μg/L | <0.05 | <0.10 | <0.05 | <0.05 | <0.05 |
| K | mg/L | 10 | 6 | 3 | 6 | 4 |
| Mg | " | 272 | 259 | 130 | 255 | 92.4 |
| Mn | " | 0.2814 | 0.0108 | 0.0236 | 0.1096 | 0.0520 |
| Na | " | 172 | 140 | 58 | 144 | 85 |
| Ni | " | <0.0004 | 0.0022 | 0.0005 | <0.0004 | <0.0004 |
| Pb | " | <0.004 | <0.008 | <0.004 | <0.004 | <0.004 |
| Zn | " | 0.013 | 0.042 | 0.015 | 0.008 | 0.005 |

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON MARCH 5, 2008

| Parameter | Unit | Lysimeter No. L-6 |
|--------------------------------------|------|----------------------|
| pH ¹ | | 7.6 |
| EC | mS/m | 141 |
| Total Dissolved Solids | mg/L | 1,286 |
| Total Diss. Org. Carbon | " | 1 |
| Cl ⁻ | " | 16 |
| SO ₄ ⁼ | " | 631 |
| TKN | " | 0.30 |
| NH ₃ -N | " | 0.23 |
| NO ₂ + NO ₃ -N | " | 0.32 |
| Total P | " | 0.08 |
| Alkalinity as CaCO ₃ | " | 273 |
| Al | " | 0.029 |
| Ca | " | 163 |
| Cd | " | 0.0004 |
| Cr | " | <0.0005 |
| Cu | " | <0.002 |
| Fe | " | 0.452 |
| Hg | μg/L | <0.05 |
| K | mg/L | 3 |
| Mg | " | 81.2 |
| Mn | " | 0.0333 |
| Na | " | 68 |
| Ni | " | <0.0004 |
| Pb | " | <0.004 |
| Zn | " | 0.005 |

¹pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE CALUMET EAST SOLIDS MANAGEMENT DRYING AREA DURING JANUARY 2008

| Parameter | Unit | Concentration ¹ |
|------------------------------------|-------|----------------------------|
| pH | | 7.3 |
| Total Solids | % | 60.7 |
| Total Volatile Solids ² | % | 28.2 |
| TKN | mg/kg | 15,318 |
| NH ₃ -N | '' | 1,067 |
| Total P | '' | 21,832 |
| Al | '' | 16,386 |
| As | '' | 9.0 |
| Ca | '' | 52,236 |
| Cd | '' | 5 |
| Cr | '' | 92 |
| Cu | '' | 329 |
| Fe | '' | 31,939 |
| Hg | '' | 1.2 |
| K | '' | 3,978 |
| Mg | '' | 18,783 |
| Mn | '' | 901 |
| Mo | '' | 11 |
| Na | '' | <171 |
| Ni | '' | 36 |
| Pb | '' | 101 |
| Se | '' | <1.4 |
| Zn | '' | 827 |

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.