Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 17-12

HANOVER PARK WATER RECLAMATION PLANT

FISCHER FARM MONITORING REOPRT FOR

FOURTH QUARTER 2016

FEBRUARY 2017

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 312-751-5600

HANOVER PARK WATER RECLAMATION PLANT
FISCHER FARM MONITORING REPORT FOR
FOURTH QUARTER 2016

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

CECIL LUE-HING RESEARCH AND DEVELOPMENT COMPLEX
6001 WEST PERSHING ROAD CICERO, ILLINOIS 60804-4112

February 24, 2017

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

Dear Mr. Keller:

Subject: Hanover Park Water Reclamation Plant - Illinois Environmental Protection Agency Permit No. 2012-SC-2255, Monitoring Report for October, November, and December 2016

The attached tables contain the monitoring data for the Hanover Park Water Reclamation Plant (WRP) Fischer Farm site for October, November, and December 2016 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2012-SC-2255. Analytical data for well water samples collected during the quarter are presented in Tables 1 and 2.

Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled in October, November, and December 2016, and data for these samples are presented in Table 3. The volumes of drainage water returned to the WRP during the fourth quarter were estimated as 1.7, 4.1, and 3.9 million gallons in October, November, and December, respectively. The analytical data for lagoon supernatant and liquid biosolids applied to Fischer Farm fields in October, November, and December are presented in Tables 4, 5 and 6. The volume and dry weights of supernatant and liquid biosolids applied to fields are presented in Table 7. Field and water monitoring locations are presented in Figure 1.

An investigation of Well 7 was conducted in November 2016 to determine the reason for high NH_3 levels observed in the well. This investigation involved purging the well for 60 minutes and taking an additional sample for analysis. This additional sample had an NH_3 concentration of 74 mg/L, which indicates a potential persistent source of NH_3. The investigation will continue in spring 2017.

The data reported are as follows:

Table 1 Analysis of Water From Monitoring Well W-7 at the Hanover Park Fischer Farm Site Sampled during October and November 2016.

Subject: Hanover Park Water Reclamation Plant - Illinois Environmental Protection Agency Permit No. 2012-SC-2255, Monitoring Report for October, November, and December 2016

Table 2 Analysis of Water From Monitoring Wells W-3, W-5, W-6, and W-8 at the Hanover Park Fischer Farm Site Sampled on November 29, 2016.

Table 3 Analysis of Combined Surface and Subsurface Drainage From the Fischer Farm Site Returned to the Hanover Park Water Reclamation Plant During October, November, and December 2016.

Table 4 Analysis of Lagoon Supernatant Applied to Fields at the Hanover Park Fischer Farm Site During October 2016.

Table 5 Analysis of Lagoon Supernatant Applied to Fields at the Hanover Park Fischer Farm Site During November 2016.

Table 6 Analysis of Liquid Biosolids Applied to Fields at the Hanover Park Fischer Farm Site During December 2016.

Table 7 Volumes and Dry Weights of Lagoon Supernatant and Liquid Biosolids Applied to Fields During October, November, and December 2016 at the Hanover Park Fischer Farm Site.

Figure 1 Map of Fields and Wells at the Hanover Park Fischer Farm Site of the Metropolitan Water Reclamation District of Greater Chicago.

Very truly yours,

Albert E. Cox, Ph.D.
Environmental Monitoring and Research Manager
Monitoring and Research Department

AC:DB:cm
Attachments
cc/att: Mr. J. Patel, Manager, IEPA – Des Plaines
Mr. J. Colletti, USEPA, Region 5
Mr. P. Kuefler, USEPA, Region 5
Ms. D. Coolidge
Dr. H. Zhang
Dr. A. Cox
Dr. G. Tian
Dr. D. Brose

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELL W-7 AT THE HANOVER PARK FISCHER FARM SITE SAMPLED DURING OCTOBER AND NOVEMBER 2016

Parameter	Unit	Date Sampled[1]			
		10/04/16	10/18/16	11/08/16	11/29/16
pH[2]		7.3	7.3	7.2	7.5
EC	mS m^{-1}	181	190	150	183
Cl^-	mg L^{-1}	48	45	43	43
SO_4^{2-}	"	246	267	93	248
Alkalinity as $CaCO_3$	"	773	767	731	717
TKN		78	82	81	79
NH_3-N		73	74	77	77
NO_2+NO_3-N		<0.15	<0.15	<0.15	<0.15
Total P		0.49	0.52	0.58	0.59
Cd		<0.001	<0.001	<0.001	<0.001
Cr		<0.003	<0.003	<0.003	<0.003
Cu		<0.004	<0.004	<0.004	<0.004
Fe		3.7	4.1	3.4	3.9
Mn		0.044	0.051	0.040	0.045
Ni		<0.005	<0.005	<0.005	<0.005
Zn		0.051	0.071	0.040	0.061

[1]Well 7 was frozen and did not produce samples in December.
[2]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM MONITORING WELLS W-3, W-5, W-6, AND W-8 AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON NOVEMBER 29, 2016

Parameter	Unit	Monitoring Well No. W-3[1]	W-5	W-6	W-8
pH[2]		NRR	8.0	7.9	8.2
EC	mS m^{-1}	"	75	84	63
Cl^-	mg L^{-1}	"	16	29	8.0
SO_4^{2-}	"	"	99	121	66
Alkalinity as $CaCO_3$	"	"	316	311	284
TKN	"	"	<1.0	<1.0	<1.0
NH_3-N	"	"	0.27	0.31	0.52
NO_2+NO_3–N	"	"	<0.15	<0.15	<0.15
Total P	"	"	<0.10	<0.10	<0.10
Cd	"	"	<0.001	<0.001	<0.001
Cr	"	"	<0.003	<0.003	<0.003
Cu	"	"	<0.004	<0.004	<0.004
Fe	"	"	2.3	2.4	0.70
Mn	"	"	0.026	0.043	0.022
Ni	"	"	<0.005	<0.005	<0.005
Zn	"	"	<0.005	<0.005	<0.005

[1] NRR = no reported results; Well 3 was frozen and did not produce a sample in November.
[2] pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO THE HANOVER PARK WATER RECLAMATION PLANT DURING OCTOBER, NOVEMBER, AND DECEMBER 2016

Date	Sump	NH_3-N	TSS[1]	BOD_5
		---------- mg L^{-1} ----------		
10/04/2016	East	6.0	30	20
10/04/2016	West	13	52	46
10/18/2016	East	4.3	12	6.0
10/18/2016	West	3.4	4.0	5.0
11/08/2016	East	4.2	5.0	7.0
11/08/2016	West	25	13	24
11/29/2016	East	8.2	22	10
11/29/2016	West	11	38	16
12/20/2016	East	0.76	<4.0	<2.0
12/20/2016	West	<0.10	5.0	<2.0

[1]Total suspended solids.

TABLE 4: ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER 2016

Constituent	Unit	Concentration[1]
pH		8.0
Total Solids	%	0.16
Total Volatile Solids[2]	"	59
Volatile Acids[3]	mg L^{-1}	64
TKN	"	537
NH_3-N		445
Total P		59
Cd		<0.001
Cr		<0.003
Cu		0.052
Mn		0.233
Ni		0.029
Pb		<0.010
Zn		0.083

[1]Mean of two samples.
[2]Total volatile solids as a percentage of total solids.
[3]As acetic acid.

TABLE 5: ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING NOVEMBER 2016

Constituent	Unit	Concentration[1]
pH		7.9
Total Solids	%	0.13
Total Volatile Solids[2]	"	58
Volatile Acids[3]	mg L^{-1}	<5.0
TKN	"	571
NH_3-N	"	NRR[4]
Total P	"	53
Cd	"	<0.001
Cr	"	0.003
Cu	"	0.052
Mn	"	0.192
Ni	"	0.029
Pb	"	<0.010
Zn	"	0.074

[1]One sample.
[2]Total volatile solids as a percentage of total solids.
[3]As acetic acid.
[4]NRR = No results reported due to incomplete laboratory analysis.

TABLE 6: ANALYSIS OF LIQUID BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING DECEMBER 2016

Constituent	Unit	Concentration[1]
pH		7.5
Total Solids	%	2.2
Total Volatile Solids[2]	"	71
Volatile Acids[3]	mg L^{-1}	21
TKN	"	1,843
NH_3-N	"	820
Total P	"	510
Cd	mg kg^{-1}	2.0
Cr	"	34.5
Cu	"	826
Mn	"	627
Ni	"	29.5
Pb	"	22.5
Zn	"	894

[1]Mean of two samples.
[2]Total volatile solids as a percentage of total solids.
[3]As acetic acid.

TABLE 7: VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT AND LIQUID BIOSOLIDS APPLIED TO FIELDS DURING OCTOBER, NOVEMBER, AND DECEMBER 2016 AT THE HANOVER PARK FISCHER FARM SITE

Field	Date	Biosolids Type	Volume (Gallons)	Dry Weight (Tons)
1	10/09/16	Supernatant	350,000	2.2
6	10/29/16	Supernatant	290,000	1.8
5	11/04/16	Supernatant	350,000	1.9
2	11/14/16	Supernatant	380,000	2.2
1	11/27/16	Supernatant	90,000	0.50
6	12/21/16	Biosolids	2,181,872	172
5	12/22/16	Biosolids	2,105,015	137
1	12/27/16	Biosolids	1,030,732	86
3	12/28/16	Biosolids	956,437	106
2	12/29/16	Biosolids	744,655	118
Total			8,478,711	628

FIGURE 1 MAP OF FIELDS AND WELLS AT THE HANOVER PARK FISCHER FARM SITE OF THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO