

*Protecting Our Water Environment*



**METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO**

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

***REPORT NO. 08-14***

***HANOVER PARK WATER RECLAMATION PLANT  
FISCHER FARM MONITORING REPORT FOR  
FOURTH QUARTER 2007***

***March 2008***

**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**

**FOURTH QUARTER 2007**

**Research and Development  
P. Lindo  
A. Cox**

**March 2008**

# Protecting Our Water Environment

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March 5, 2008

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 WRP – IEPA Permit No. 2007-SC-2951, Monitoring  
Report for October, November, and December 2007

The attached report includes ten tables of the monitoring results for the Hanover Park Water Reclamation Plant Fischer Farm site for the fourth quarter of 2007.

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:PL:spy  
Enclosure

cc w/enc: Jay Patel, Manager, IEPA Region II – Des Plaines  
Mr. Valdis Aistars, USEPA Region V  
Mr. Ash Sajjad, USEPA Region V  
Stuba/Khalil  
Granato/O'Connor/Cox  
Lindo/Patel, M.

cc w/o enc: Sharma/Garelli/Lazicki  
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## FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for the Hanover Park Fischer Farm Site as specified in the Illinois Environmental Protection Agency Permit No. 2007-SC-2951 for the fourth quarter of 2007.

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## ACKNOWLEDGMENT

The assistance given by Ms. Minaxi Patel, Sanitary Chemist I, of the Environmental Monitoring and Research Division, and Mr. John Chavich, Sanitary Chemist IV, of the John E. Egan Analytical Laboratory Section, is greatly appreciated.

## DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.



## HANOVER PARK WATER RECLAMATION PLANT FISCHER FARM REPORT FOR FOURTH QUARTER OF 2007

During October, November, and December 2007, activities at the Hanover Park Water Reclamation Plant (WRP) Fischer Farm included well and field drainage water sampling, and flow measurements. These monitoring activities are required by the Illinois Environmental Protection Agency Operating Permit No. 2007-SC-2951. Fields and water monitoring locations are presented in Figure 1.

Water from each of the six monitoring wells was sampled twice monthly in October, November, and December. Analytical data for samples collected during the quarter are presented in Tables 1 through 6.

Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled twice per month in October, November, and December. Analytical data for these samples are presented in Table 7. The volumes of drainage water returned to the WRP during the fourth quarter were estimated as 2.62, 2.19, and 6.02 million gallons (MG) in October, November, and December, respectively.

During the quarter, a total of 9.12 MG lagoon supernatant and biosolids containing 1,085 dry tons of solids was applied to Fields 1, 2, 3, 5, and 6 at the Fischer Farm site. The analytical data for the lagoon supernatant and biosolids are presented in Table 8 and Table 9, respectively. The volumes and dry weights applied are reported in Table 10.

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

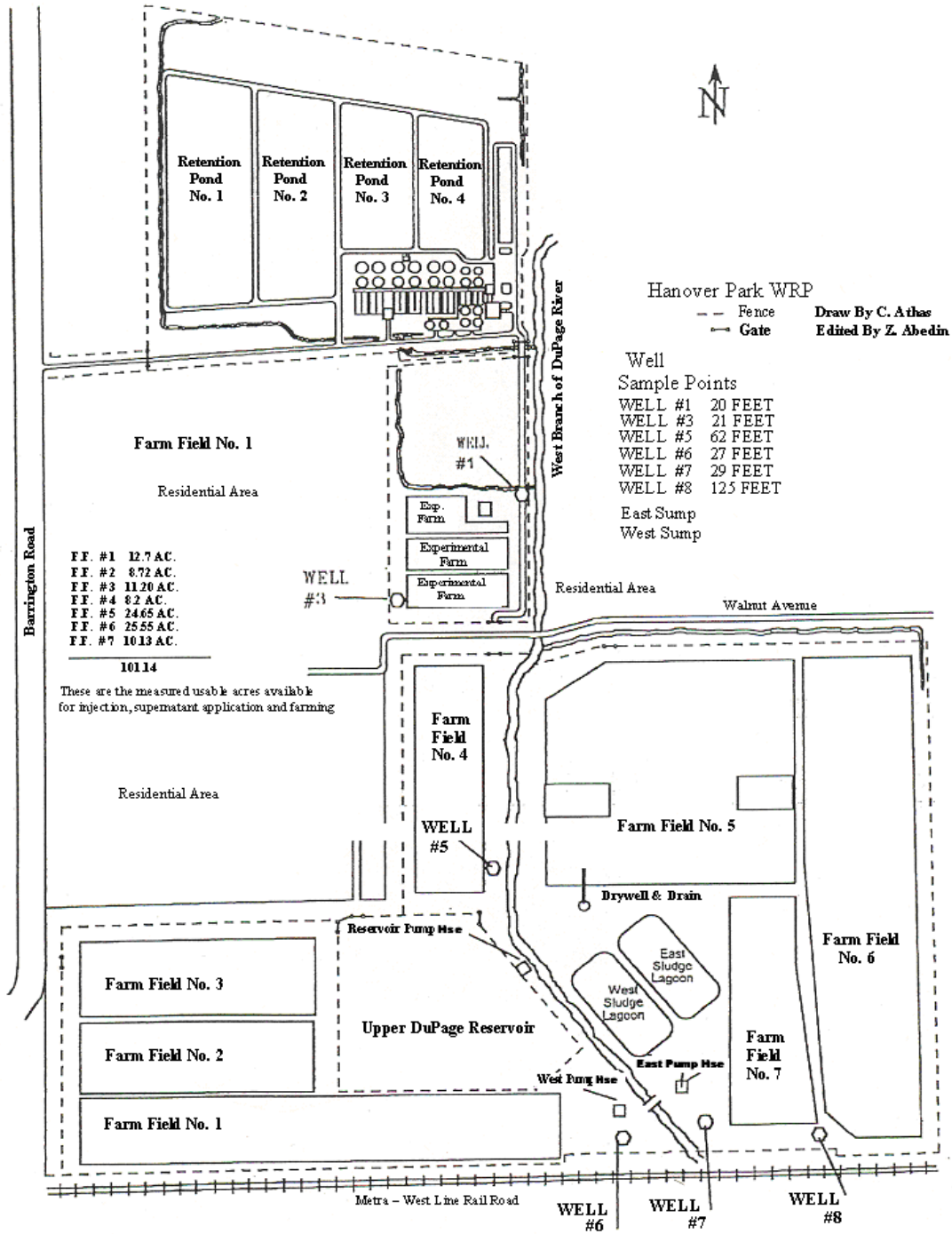


TABLE 1: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON OCTOBER 9, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>		7.0	7.0	7.5	7.4	7.1	8.0
EC	mS/m	202	107	74	95	120	64
Cl <sup>-</sup>	mg/L	539	23	13	41	43	7.0
SO <sub>4</sub> <sup>=</sup>	"	8.0	287	98	169	241	63
Alkalinity <sup>2</sup>	"	255	371	320	324	442	298
TKN	"	5.9	6.2	0.30	0.40	9.3	0.24
NH <sub>3</sub> -N	"	4.2	0.46	0.29	0.26	9.3	0.35
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.31	0.20	<0.02	0.02	<0.02	<0.02
Total P	"	0.49	1.9	<0.02	0.07	0.02	0.11
Cd	"	0.0018	0.0034	<0.0003	<0.0003	0.0003	<0.0003
Cr	"	<0.002	0.004	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0025	<0.0005	0.0111	0.0048	<0.0005	0.0046
Fe	"	33.7	104	1.76	3.12	4.97	1.52
Mn	"	0.7827	0.4333	0.0183	0.0394	0.0632	0.0412
Ni	"	0.0049	0.0558	0.0019	0.0050	0.0034	0.0015
Zn	"	0.1197	0.3553	0.0417	0.0040	0.0374	0.0029
Fecal Coliform MPN		8	<1	<1	<1	<1	<1

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.

TABLE 2: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON OCTOBER 23, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>		7.0	7.0	7.5	7.4	7.1	7.9
EC	mS/m	210	102	72	90	123	65
Cl <sup>-</sup>	mg/L	543	22	13	31	44	7.0
SO <sub>4</sub> <sup>=</sup>	''	11	288	103	151	234	71
Alkalinity <sup>2</sup>	''	271	367	317	325	426	289
TKN	''	7.0	4.3	0.29	0.28	9.6	0.21
NH <sub>3</sub> -N	''	4.7	0.30	0.29	0.23	9.5	0.39
NO <sub>2</sub> + NO <sub>3</sub> -N	''	0.28	0.14	0.02	<0.02	<0.02	<0.02
Total P	''	0.73	1.6	0.11	0.15	0.13	0.12
Cd	''	0.0023	0.0048	<0.0003	0.0003	0.0004	<0.0003
Cr	''	<0.002	0.004	<0.002	<0.002	<0.002	<0.002
Cu	''	0.0094	<0.0005	0.0193	0.0041	0.0005	0.0021
Fe	''	37.9	103	1.38	2.79	4.45	1.23
Mn	''	0.8693	0.4768	0.0141	0.0320	0.0581	0.0369
Ni	''	0.0055	0.0146	0.0013	0.0066	0.0022	<0.0007
Zn	''	0.1888	0.4274	0.0057	0.0048	0.0308	0.0026
Fecal Coliform MPN		<1	<1	<1	<1	<1	<1

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.

TABLE 3: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON NOVEMBER 6, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>		7.4		7.6	7.4	7.2	8.0
EC	mS/m	218		75	95	115	64
Cl <sup>-</sup>	mg/L	581		14	47	45	7.0
SO <sub>4</sub> <sup>=</sup>	"	12		94	172	245	67
Alkalinity <sup>2</sup>	"	273		320	319	424	294
TKN	"	8.2	W	0.21	0.33	8.9	0.42
NH <sub>3</sub> -N	"	4.3	E	0.34	0.30	8.7	0.38
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.59	L	0.02	0.02	0.02	0.02
Total P	"	1.0	L	0.02	0.07	0.02	0.09
Cd	"	0.0021	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	0.003	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0060	Y	0.0184	0.0009	<0.0005	0.0011
Fe	"	78.6		3.18	3.31	4.61	1.34
Mn	"	1.275		0.0229	0.0425	0.0638	0.0415
Ni	"	0.0098		0.0010	0.0013	0.0013	<0.0007
Zn	"	0.3641		0.0092	0.0024	0.0393	0.0016
Fecal Coliform MPN		<1		<1	<1	<1	<1

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.

TABLE 4: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON NOVEMBER 20, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>				7.4	7.4	7.2	7.9
EC	mS/m			76	100	121	65
Cl <sup>-</sup>	mg/L			13	51	46	7.0
SO <sub>4</sub> <sup>=</sup>	"			96	178	244	67
Alkalinity <sup>2</sup>	"			320	321	427	298
TKN	"	W	W	0.38	0.43	8.5	0.38
NH <sub>3</sub> -N	"	E	E	0.29	0.26	8.2	0.34
NO <sub>2</sub> + NO <sub>3</sub> -N	"	L	L	0.03	0.03	0.03	0.03
Total P	"	L	L	<0.02	0.07	0.02	<0.02
Cd	"	D	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	R	R	<0.002	<0.002	<0.002	<0.002
Cu	"	Y	Y	0.0122	0.0024	<0.0005	0.0013
Fe	"			1.78	3.57	4.83	1.73
Mn	"			0.0168	0.0471	0.0642	0.0453
Ni	"			0.0011	0.0032	0.0019	0.0017
Zn	"			0.0085	0.0079	0.0287	0.0039
Fecal Coliform MPN				<1	<1	<1	<1

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.

TABLE 5: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON DECEMBER 4, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>		7.1		7.5	7.5	7.3	
EC	mS/m	250		79	98	123	
Cl <sup>-</sup>	mg/L	651		13	36	46	
SO <sub>4</sub> <sup>=</sup>	"	15		96	163	243	
Alkalinity <sup>2</sup>	"	285		319	336	422	
TKN	"	6.1	W	0.29	0.31	7.8	W
NH <sub>3</sub> -N	"	3.8	E	0.32	0.23	7.8	E
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.17	L	0.02	0.02	0.02	L
Total P	"	0.29	L	0.04	0.09	0.06	L
Cd	"	<0.0003	D	<0.0003	<0.0003	<0.0003	D
Cr	"	<0.002	R	<0.002	<0.002	<0.002	R
Cu	"	0.0021	Y	0.0104	0.0077	<0.0005	Y
Fe	"	13.2		1.74	2.78	4.53	
Mn	"	1.234		0.0179	0.0330	0.0614	
Ni	"	0.0025		0.0020	0.0020	0.0017	
Zn	"	0.0617		0.0052	0.0027	0.0680	
Fecal Coliform MPN		20		<1	<1	<1	

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.

TABLE 6: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT  
THE HANOVER PARK FISCHER FARM SITE  
SAMPLED ON DECEMBER 18, 2007

Parameter	Unit	Well					
		1	3	5	6	7	8
pH <sup>1</sup>		7.4	7.5	7.7	7.5		
EC	mS/m	269	128	78	104		
Cl <sup>-</sup>	mg/L	740	19	13	53		
SO <sub>4</sub> <sup>=</sup>	"	9.0	408	101	175		
Alkalinity <sup>2</sup>	"	251	321	319	321		
TKN	"	5.5	1.3	0.24	0.33	W	W
NH <sub>3</sub> -N	"	4.0	0.13	0.31	0.29	E	E
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.13	0.15	0.03	<0.02	L	L
Total P	"	0.14	0.15	0.02	0.09	L	L
Cd	"	0.0066	0.0026	<0.0003	<0.0003	D	D
Cr	"	<0.002	0.004	<0.002	<0.002	R	R
Cu	"	<0.0005	<0.0005	0.0130	0.0026	Y	Y
Fe	"	90.0	73.2	3.09	3.80		
Mn	"	2.738	0.3282	0.0228	0.0537		
Ni	"	0.0071	0.0111	0.0012	0.0047		
Zn	"	0.3326	0.3497	0.0095	0.0043		
Fecal Coliform MPN		21	<1	<1	<1		

<sup>1</sup>Samples analyzed beyond recommended holding time of 15 minutes.

<sup>2</sup>As CaCO<sub>3</sub>.

MPN = Most probable number/100 mL.



TABLE 7: ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO HANOVER PARK WATER RECLAMATION PLANT DURING OCTOBER, NOVEMBER, AND DECEMBER 2007

Date	Sump	NH <sub>3</sub> -N <sup>1</sup>	TSS <sup>2</sup>	BOD <sub>5</sub> <sup>3</sup>
		..... mg/L .....		
10/09/07	East	10	29	13
10/09/07	West	70	58	53
10/23/07	East	139	75	NA
10/23/07	West	58	74	61
11/06/07	East	186	81	75
11/06/07	West	248	296	NA
11/20/07	East	355	458	219
11/20/07	West	58	54	40
12/04/07	East	22	38	7
12/04/07	West	2.2	33	9
12/18/07	East	18	30	4
12/18/07	West	0.49	66	4

<sup>1</sup>Ammonia Nitrogen.

<sup>2</sup>Total Suspended Solids.

<sup>3</sup>Biochemical Oxygen Demand.

NA = No analysis.

TABLE 8: ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS  
 AT THE HANOVER PARK FISCHER FARM SITE  
 DURING OCTOBER AND NOVEMBER 2007

Parameter	Unit	Concentration <sup>1</sup>
pH		7.9
TS	%	0.12
TVS <sup>2</sup>	"	56.9
TKN	mg/kg	262,756
NH <sub>3</sub> -N	"	252,672
Volatile Acids <sup>3</sup>	"	8,214
Total P	"	43,920
As	"	16
Cd	"	<0.51
Cr	"	<2.5
Cu	"	47
Hg	"	0.07
Mn	"	179
Mo	"	<1.7
Ni	"	23
Pb	"	2.4
Se	"	2.6
Zn	"	74

<sup>1</sup>Values are the means of seven samples of lagoon supernatant.

<sup>2</sup>Total volatile solids as a percentage of total solids.

<sup>3</sup>As acetic acid.

TABLE 9: ANALYSIS OF LAGOON BIOSOLIDS APPLIED TO FIELDS  
 AT THE HANOVER PARK FISCHER FARM SITE  
 DURING NOVEMBER AND DECEMBER 2007

Parameter	Unit	Concentration <sup>1</sup>
pH		7.6
TS	%	3.36
TVS <sup>2</sup>	"	69.3
TKN	mg/kg	102,075
NH <sub>3</sub> -N	"	26,277
Volatile Acids <sup>3</sup>	"	440
Total P	"	35,709
As	"	10
Cd	"	2
Cr	"	44
Cu	"	1,209
Hg	"	2.4
Mn	"	764
Mo	"	14
Ni	"	51
Pb	"	44
Se	"	6
Zn	"	943

<sup>1</sup>Values are the means of three samples of lagoon supernatant.

<sup>2</sup>Total volatile solids as a percentage of total solids.

<sup>3</sup>As acetic acid.

TABLE 10: VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT  
 APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE  
 DURING OCTOBER, NOVEMBER, AND DECEMBER 2007

Field	Date	Type of Material	Volume (Gallons)	Dry Weight (Tons)
1	10/17/07	Supernatant	80,000	0.4
1	10/26/07	"	260,000	1.3
1	11/13/07	Biosolids	378,000	14.3
1	12/01/07	"	168,000	32.9
2	10/10/07	Supernatant	150,000	0.8
2	10/15/07	"	150,000	1.0
2	11/05/07	"	130,000	0.6
2	11/30/07	Biosolids	756,000	132.7
3	11/28/07	Biosolids	200,000	34.9
3	11/29/07	"	854,000	147.7
5	10/03/07	Supernatant	160,000	0.9
5	10/16/07	"	90,000	0.5
5	10/29/07	"	140,000	0.6
5	11/01/07	"	230,000	1.1
5	11/20/07	"	630,000	3.1
5	11/14/07	Biosolids	560,000	45.7
5	11/15/07	"	525,000	62.6
5	11/16/07	"	567,000	89.6
5	11/17/07	"	378,000	68.4
6	11/17/07	Biosolids	70,000	12.6
6	11/19/07	"	567,000	109.4
6	11/20/07	"	560,000	117.6
6	11/21/07	"	350,000	61.7
6	11/26/07	"	539,000	42.4
6	11/27/07	"	581,000	93.5
6	11/28/07	"	45,000	7.8
Total			9,118,000	1,085.0