

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 06-13

***HANOVER PARK FISCHER FARM MONITORING REPORT FOR
FOURTH QUARTER 2005***

MARCH 2006

March 10, 2005

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:

The attached report contains the monitoring results for the Hanover Park Water Reclamation Plant Fischer Farm site for the fourth quarter of 2005, as required by IEPA Operating Permit No. 2002-SC-0672.

Very truly yours,

Richard Lanyon
Director
Research and Development

RL:PL:spy
Enclosure

cc w/enc: Jay Patel, Manager, IEPA Region II - Des Plaines
Mr. Valdis Aistars, USEPA Region V
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**HANOVER PARK WATER RECLAMATION PLANT
FISCHER FARM REPORT FOR
FOURTH QUARTER OF 2005**

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

March 2006

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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. 2002-SC-0672 for the fourth quarter of 2005.

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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.

Thanks are due to Ms. Sabina Yarn for typing this report.

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 2005

During October, November, and December 2005, 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 (IEPA) Operating Permit No. 2002-SC-0672. 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 2005. Analytical data for samples collected during the quarter are presented in Tables 1 through 6.

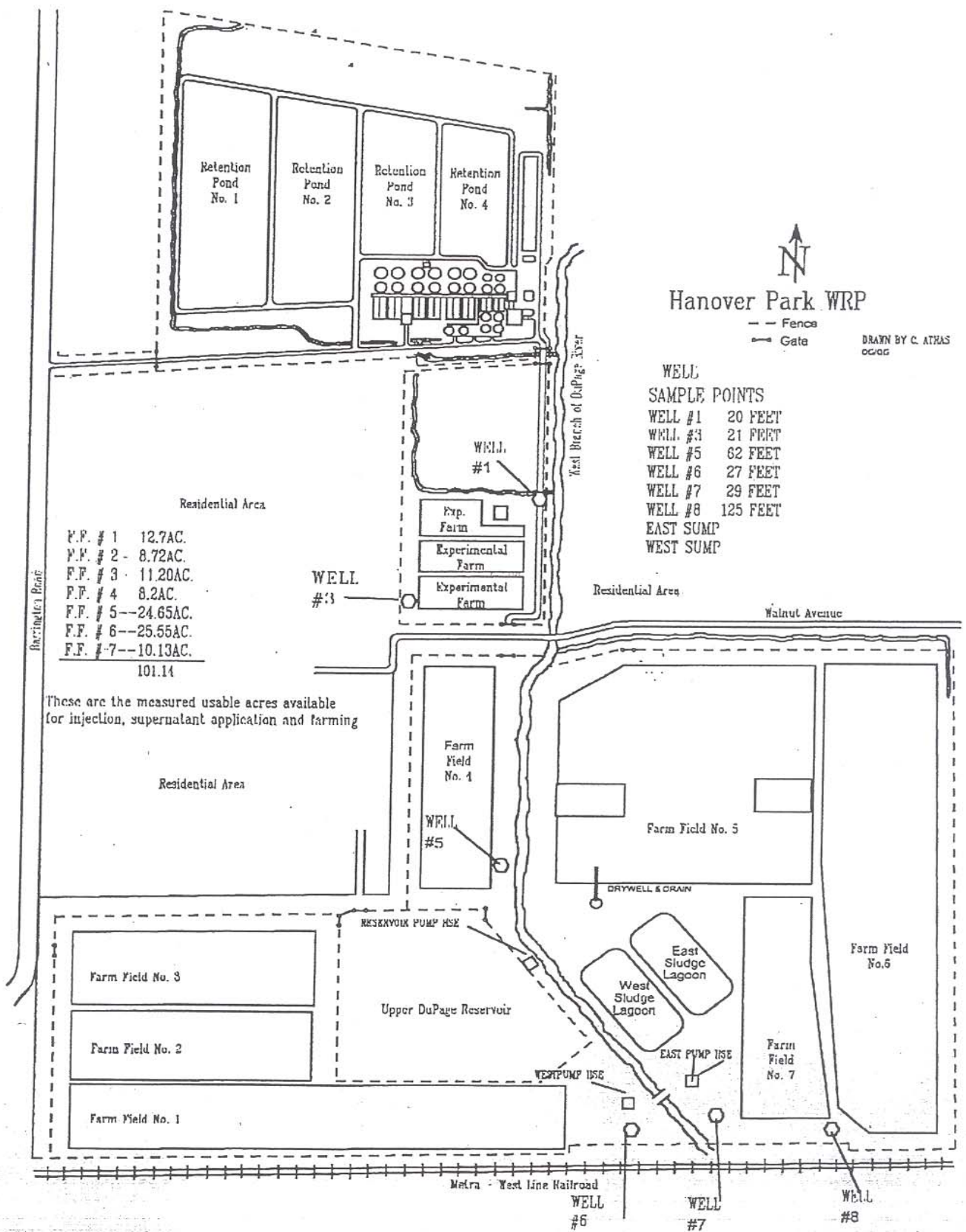
Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled twice per month in October, November, and December. Analytical data for these samples are presented in Table 7. The volumes of drainage water returned to the WRP during the fourth quarter were estimated as 5.05 (October), 2.45 (November), and 3.47 (December) million gallons (MG).

Between October and December, 3.975 MG lagoon biosolids containing 620 dry tons solids were pumped and applied to Fields 1 to 6 at the Fischer Farm site. In addition, 1.938 MG sediment containing 3,020 dry tons solids were also applied to Fields 1, 2, and 3 from several wastewater retention ponds. The analytical data for the lagoon biosolids and pond sediment applied to these fields are presented in Tables 8 and 9, respectively. The volumes and dry weights are reported in Table 10.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 1

FIELDS AND WELLS AT THE HANOVER PARK FISCHER FARM SITE



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 11, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*		7.5		7.6	7.5	7.2	7.8
EC	mS/m	218		75	102	115	61
Cl ⁻	mg/L	399		14	37	33	8
SO ₄ ⁼	"	25		97	224	217	64
Alkalinity as CaCO ₃	"	587		319	314	439	274
TKN	"	7	W	0.7	0.8	12	0.6
NH ₃ -N	"	5.7	E	0.25	0.34	12	0.43
NO ₂ +NO ₃ -N	"	0.14	L	<0.02	0.09	0.02	<0.02
Total P	mg/L	0.23	L	0.15	0.18	0.24	0.23
Cd	"	<0.0003	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0050	Y	0.0050	0.0030	<0.0005	0.0060
Fe	"	13.1		1.67	4.77	4.79	3.31
Mn	"	1.430		0.0180	0.0570	0.0590	0.0470
Ni	"	0.0030		0.0020	0.0040	0.0020	0.0020
Zn	"	0.0760		0.0040	0.0050	0.0250	0.0070
Fecal coliform per 100 mL		2		<1	<1	<1	<1

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT
THE HANOVER PARK FISCHER FARM SITE SAMPLED ON
OCTOBER 18, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*		8.0		8.5	7.6	7.4	7.9
EC	mS/m	205		69	92	103	66
Cl ⁻	mg/L	385		14	27	32	7
SO ₄ ⁼	"	25		95	187	214	67
Alkalinity as CaCO ₃	"	558		317	319	432	297
TKN	"	7	W	0.4	0.5	12	0.5
NH ₃ -N	"	5.2	E	0.27	0.29	12	0.33
NO ₂ +NO ₃ -N	"	0.20	L	0.06	0.05	0.08	0.05
Total P	mg/L	0.18	L	0.11	0.11	0.12	0.11
Cd	"	0.0030	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	0.002	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0200	Y	0.0170	0.0040	<0.0005	0.0050
Fe	"	72.0		2.45	3.09	4.42	2.30
Mn	"	1.816		0.0210	0.0350	0.0550	0.0600
Ni	"	0.0120		0.0010	0.0040	0.0020	0.0010
Zn	"	0.3660		0.0050	0.0040	0.0220	0.0030
Fecal coliform per 100 mL		12		<1	<1	<1	<1

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT
THE HANOVER PARK FISCHER FARM SITE SAMPLED ON
NOVEMBER 15, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*		8.5		8.0	7.6	7.7	7.9
EC	mS/m	186		72	94	113	52
Cl ⁻	mg/L	369		14	31	33	7
SO ₄ ⁼	"	32		100	192	225	69
Alkalinity as CaCO ₃	"	435		318	321	437	294
TKN	"	6	W	1	0.5	12	0.5
NH ₃ -N	"	2.5	E	0.34	0.32	12	0.37
NO ₂ +NO ₃ -N	"	0.48	L	0.08	0.04	0.05	0.05
Total P	mg/L	0.98	L	0.09	0.09	0.10	0.10
Cd	"	0.0198	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	0.059	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.1565	Y	0.0145	0.0032	<0.0005	0.0027
Fe	"	411		2.74	3.29	4.54	1.70
Mn	"	4.190		0.0284	0.0379	0.0558	0.0389
Ni	"	0.0602		0.0021	0.0039	0.0023	0.0023
Zn	"	2.403		0.0044	0.0037	0.0287	0.0041
Fecal coliform per 100 mL		1		<1	<1	<7	<1

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT
THE HANOVER PARK FISCHER FARM SITE SAMPLED ON
NOVEMBER 22, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*				7.6	7.5	7.2	7.9
EC	mS/m			73	95	118	64
Cl ⁻	mg/L			14	39	34	7
SO ₄ ⁼	"			98	205	218	67
Alkalinity as CaCO ₃	"			311	317	433	300
TKN	"	W	W	0.4	0.6	11	0.4
NH ₃ -N	"	E	E	0.28	0.36	12	0.36
NO ₂ +NO ₃ -N	"	L	L	0.07	0.08	0.05	0.05
Total P	mg/L	L	L	0.09	0.09	0.10	0.09
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	0.0185	0.0037	0.0013	0.0018
Fe	"			2.34	2.79	8.24	2.57
Mn	"			0.0214	0.0336	0.0932	0.0563
Ni	"			0.0024	0.0038	0.0034	0.0021
Zn	"			0.0056	0.0060	0.0343	0.0032
Fecal coliform per 100 mL				<1	<1	<1	<1

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT
THE HANOVER PARK FISCHER FARM SITE SAMPLED ON
DECEMBER 6, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*		7.7		7.6	7.5		
EC	mS/m	216		73	97		
Cl ⁻	mg/L	352		13	38		
SO ₄ ⁼	"	72		96	204		
Alkalinity as CaCO ₃	"	631		321	321		
TKN	"	8	W	0.7	1	W	W
NH ₃ -N	"	4.6	E	0.34	0.41	E	E
NO ₂ +NO ₃ -N	"	0.24	L	0.06	0.07	L	L
Total P	mg/L	0.92	L	0.10	0.08	L	L
Cd	"	0.0024	D	<0.0003	<0.0003	D	D
Cr	"	<0.002	R	<0.002	<0.002	R	R
Cu	"	0.0075	Y	0.0375	0.0082	Y	Y
Fe	"	26.9		3.72	4.13		
Mn	"	1.786		0.0332	0.0497		
Ni	"	0.0046		0.0035	0.0052		
Zn	"	0.0902		0.0125	0.0047		
Fecal coliform per 100 mL		<1		<1	<1		

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT
THE HANOVER PARK FISCHER FARM SITE SAMPLED ON
DECEMBER 20, 2005

Parameter	Units	Well					
		1	3	5	6	7	8
pH*		7.9		7.8	8.1		
EC	mS/m	197		75	92		
Cl ⁻	mg/L	362		14	41		
SO ₄ ⁼	"	63		95	190		
Alkalinity as CaCO ₃	"	533		321	311		
TKN	"	6	W	1	0.5	W	W
NH ₃ -N	"	3.1	E	0.39	0.41	E	E
NO ₂ +NO ₃ -N	"	0.56	L	0.06	0.06	L	L
Total P	mg/L	0.72	L	0.04	<0.02	L	L
Cd	"	0.0067	D	<0.0003	<0.0003	D	D
Cr	"	0.009	R	<0.002	<0.002	R	R
Cu	"	0.0439	Y	0.0119	0.0043	Y	Y
Fe	"	135		2.38	3.96		
Mn	"	1.746		0.0217	0.0480		
Ni	"	0.0202		0.0023	0.0043		
Zn	"	0.6458		0.0039	0.0046		
Fecal coliform per 100 mL		2		<1	<1		

*Samples analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO THE HANOVER PARK WATER RECLAMATION PLANT IN OCTOBER, NOVEMBER, AND DECEMBER 2005

Date	Sump	NH ₃ -N	Total	BOD ₅
			Suspended Solids	
		----- mg/L -----		
10/11	East	117	19	8
	West	1.9	16	8
10/18	East	42	5	3
	West	0.28	8	5
11/15	East	59	15	6
	West	0.13	8	<2
11/22	East	71	33	5
	West	0.08	14	<2
12/06	East	26	13	8
	West	0.04	7	N/A
12/20	East	67	19	14
	West	0.68	10	3
MDL		0.03	2	2

NA=No analysis.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

ANALYSIS OF LAGOON BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER, NOVEMBER, AND DECEMBER 2005

Constituent	Units	Concentration ¹
pH		7.5
Total Solids	%	3.4
Total Volatile Solids	"	68.8
Total Kjeldahl-N	mg/dry kg	35,772
NH ₃ -N	"	20,415
Volatile Acids ²	"	940
Total P	"	12,760
As	mg/dry kg	5
Cd	"	4
Cr	"	60
Cu	"	1,119
Hg	"	4.3
Mn	"	506
Mo	"	16
Ni	"	49
Pb	"	46
Se	"	6
Zn	"	894

¹Values are the means of four samples of lagoon biosolids.

²As acetic acid.

No lagoon supernatant was applied to fields this quarter.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

ANALYSIS OF POND SEDIMENT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER, NOVEMBER, AND DECEMBER 2005

Constituent	Units	Concentration ¹
pH		7.9
Total Solids	%	65.9
Total Volatile Solids	"	12.6
Total Kjeldahl-N	mg/dry kg	16,632
NH ₃ -N	"	1,642
Volatile Acids ²	"	299
Total P	"	8,402
As	mg/dry kg	9
Cd	"	5
Cr	"	80
Cu	"	201
Hg	"	0.83
Mn	"	544
Mo	"	2
Ni	"	38
Pb	"	38
Se	"	<0.8
Zn	"	218

¹Values are the means of four samples of pond sediment.

²As acetic acid.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10

VOLUMES AND DRY WEIGHTS OF LAGOON BIOSOLIDS AND POND SEDIMENT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER, NOVEMBER, AND DECEMBER 2005

Field	Date	Biosolids Source	Volume Gallons	Weight* Dry Tons
6	10/13	Lagoon	444,550	59.51
6	10/14	Lagoon	541,750	72.97
5	10/15	Lagoon	354,700	49.99
5	10/17	Lagoon	476,460	71.54
5	10/18	Lagoon	298,420	47.91
2	10/19	Lagoon	390,090	57.58
3	10/19	Lagoon	98,830	14.59
3	10/20	Lagoon	430,050	72.81
4	10/20	Lagoon	56,290	9.53
4	10/21	Lagoon	333,060	59.72
1	10/22	Lagoon	426,550	79.15
1	10/24	Lagoon	124,370	24.69
Lagoon Total			3,975,120	620
3	11/30	Pond**	25,449	38.14
3	12/01	Pond**	98,967	148.31
3	12/02	Pond**	218,728	359.65
3	12/05	Pond**	14,138	21.45
2	12/05	Pond**	166,831	253.15
2	12/06	Pond**	169,658	280.27
2	12/07	Pond**	48,069	82.26
2	12/08	Pond**	14,138	19.62
1	12/08	Pond**	121,588	168.73
1	12/12	Pond**	28,276	38.32
1	12/13	Pond**	200,762	341.57
1	12/15	Pond**	183,796	357.37
1	12/16	Pond**	121,588	198.68
1	12/17	Pond**	87,657	127.02
1	12/20	Pond**	101,795	140.64
1	12/21	Pond**	16,966	25.42
3	12/21	Pond**	141,382	211.85
3	12/22	Pond**	152,692	176.66
3	12/23	Pond**	25,449	30.74
Pond Sediment Total			1,937,929	3,020
Grand Total			5,913,049	3,640

* Applied in the form of biosolids.

** Pond sediment applied to fields during the fourth quarter.