QUARTERLY MONITORING REPORT
October 2005 SAMPLING

City of Patterson Wastewater Treatment Plant
Groundwater Monitoring Program

Conducted in Accordance with
Waste Discharge Requirements Order No. 5-00-146

Prepared by:

LEE & RO, Inc.
11060 White Rock Road, Suite 100
Rancho Cordova, California 95670-6046

Prepared for:

City of Patterson
Department of Public Works
33 South Del Puerto Avenue
Patterson, CA 95363

November 2005

REPORT PREPARED BY:

Robert Owen Godwin 11/14/05

Robert Owen Godwin (DATE)
Registered Civil Engineer California No. C48045

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1. INTRODUCTION

This Quarterly Groundwater Monitoring Report has been prepared in accordance with the Waste Discharge Requirements for the City of Patterson Wastewater Treatment Plant in the City of Patterson, Stanislaus County, California. The wells were installed as part of the groundwater monitoring program developed to determine if groundwater has been, or has the potential to be, adversely impacted by wastewater treatment and disposal operations. The monitoring program will include an assessment of background conditions and a determination if there has been any impact from wastewater disposal. The groundwater monitoring program consists of the construction and quarterly sampling of ten monitoring wells.

Monitoring wells MW-1 to MW-5 were constructed in March 2001 and have been sampled on a quarterly basis since April 2001. In conjunction with the 1.25 mgd wastewater treatment plant expansion, five new monitoring wells MW-6 to MW-10 were constructed between the months of July and August of 2004. These wells have been sampled on a quarterly basis since being constructed last summer.

This report presents the results of the quarterly samples collected on October 10, 2005. Included in this report will be groundwater elevation summaries and contour maps.

2. GROUNDWATER MONITORING WELLS

Figure 1 shows the monitoring well locations.

All ten wells have 15 feet of screen with total depths ranging from 28 to 31.5 feet below ground surface (bgs). A summary of well characteristics is provided in **Table 1**.

The location of monitoring well MW-9 was disputed by the neighbors. Therefore, as of May 10, 2005, MW-9 was removed in accordance with the Stanislaus County requirements. At this time, no new location has been proposed to replace MW-9.

3. GROUNDWATER ELEVATIONS

Groundwater elevations measured to date are summarized in **Figure 2**.

Groundwater elevations measured in this sampling round are presented in **Table 2** and contoured on the map presented in **Figure 3**.

4. MONITORING WELL SAMPLING

The wells were purged and sampled on October 10, 2005 in accordance with the procedures specified in the workplan. Sampling was conducted by Richard Chrun of GeoAnalytical Laboratories. Purge logs are presented in **Appendix A**.

5. GROUNDWATER QUALITY RESULTS

The samples were analyzed by GeoAnalytical Laboratories, a state-certified environmental laboratory. Analytical results for the quarterly samples are summarized in **Table 3**. Laboratory reports for the October 2005 samples are presented in **Appendix B**.

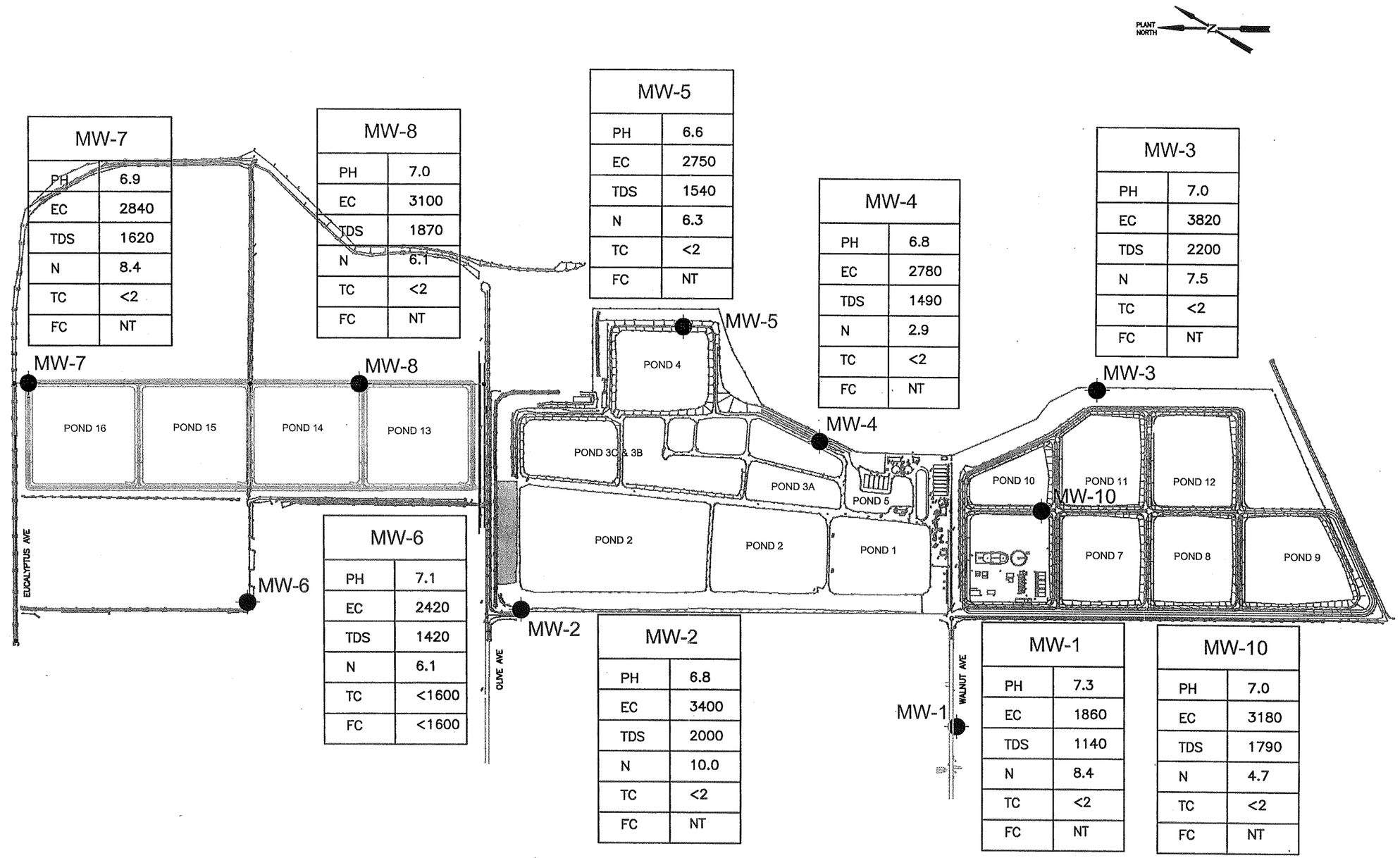
Table 1 Well Construction Summary					
	Well Depth (ft)	**Completion Type**	**Slab Surface Elevation**	**Top of Casing Elevation**	**Water Elevation 10/10/05 (ft msl)**
MW-1	27.5	Below	55.58	54.93	40.62
MW-2	29.0	Above	57.93	59.68	40.48
MW-3	28.0	Above	52.18	53.80	37.46
MW-4	30.0	Above	56.99	58.58	37.70
MW-5	29.0	Above	53.79	55.21	36.61
MW-6	30.0	Above	51.81	55.23	39.72
MW-7	31.5	Above	54.62	58.04	37.86
MW-8	29.5	Above	55.91	59.33	38.37
MW-10	30.0	Below	58.33	58.12	38.69

Table 2
Groundwater Elevations
Patterson WWTP Monitoring Wells

Water Elevations	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**	**MW-9**	**MW-10**
Water Elevation 1/9/04 (ft msl)	35.97	35.55	N/A	30.97	36.29	N/A	N/A	N/A	N/A	N/A
Water Elevation 1/29/04 (ft msl)	N/A	N/A	35.30	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Elevation 4/8/04 (ft msl)	37.24	38.06	35.14	35.36	34.41	N/A	N/A	N/A	N/A	N/A
Water Elevation 7/8/04 (ft msl)	37.61	38.82	33.76	34.44	33.60	N/A	N/A	N/A	N/A	N/A
Water Elevation 10/18/04 (ft msl)	37.90	37.68	34.87	35.40	34.19	36.01	34.33	35.41	38.08	37.38
Water Elevation 1/17/05 (ft msl)	37.83	37.22	37.05	37.72	37.50	36.81	37.54	37.98	37.28	37.94
Water Elevations 4/05/05 (ft msl)	40.03	38.87	39.47	39.58	39.58	39.15	40.13	40.20	39.36	39.85
Water Elevations 7/11/05 (ft msl)	41.95	42.15	39.78	39.87	38.93	42.14	39.13	40.42	N/A	43.12
Water Elevations 10/10/05 (ft msl)	**40.62**	**40.48**	**37.46**	**37.70**	**36.61**	**39.72**	**37.86**	**38.37**	**N/A**	**38.69**

Table 3 October 2005 Analytical Results						
	PH	Electric Conductivity	Total Dissolved Solids	Nitrate as Nitrogen	Coliform Organisms	
	Method 150.1 (Std. Units)	Method 120.1 (umhos/cm)	Method 160.1 (mg/L)	Method 300.0 (mg/L)	Total Coliform Method 9221B,C (MPN/100ml)	Fecal Coliform Method 9221E,C (MPN/100ml)
MW-1	7.3	1860	1140	8.4	<2	NT
MW-2	6.8	3400	2000	10.0	<2	NT
MW-3	7.0	3820	2200	7.5	<2	NT
MW-4	6.8	2780	1490	2.9	<2	NT
MW-5	6.6	2750	1540	6.3	<2	NT
MW-6	7.1	2420	1420	6.1	>1600	>1600
MW-7	6.9	2840	1620	8.4	<2	NT
MW-8	7.0	3100	1870	6.1	<2	NT
MW-10	7.0	3180	1790	4.7	<2	NT

ND = Not Detected
NT = Not Tested

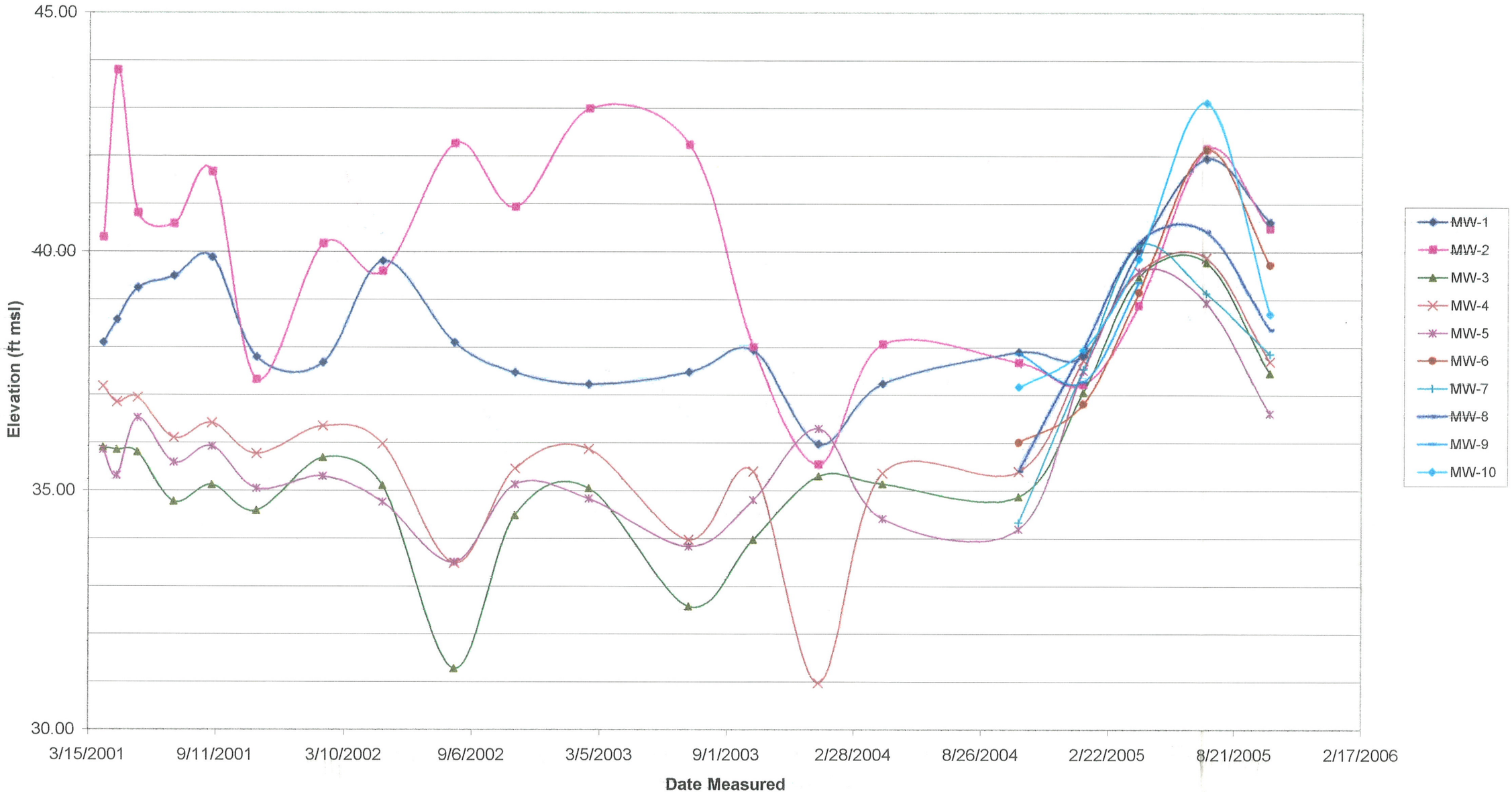


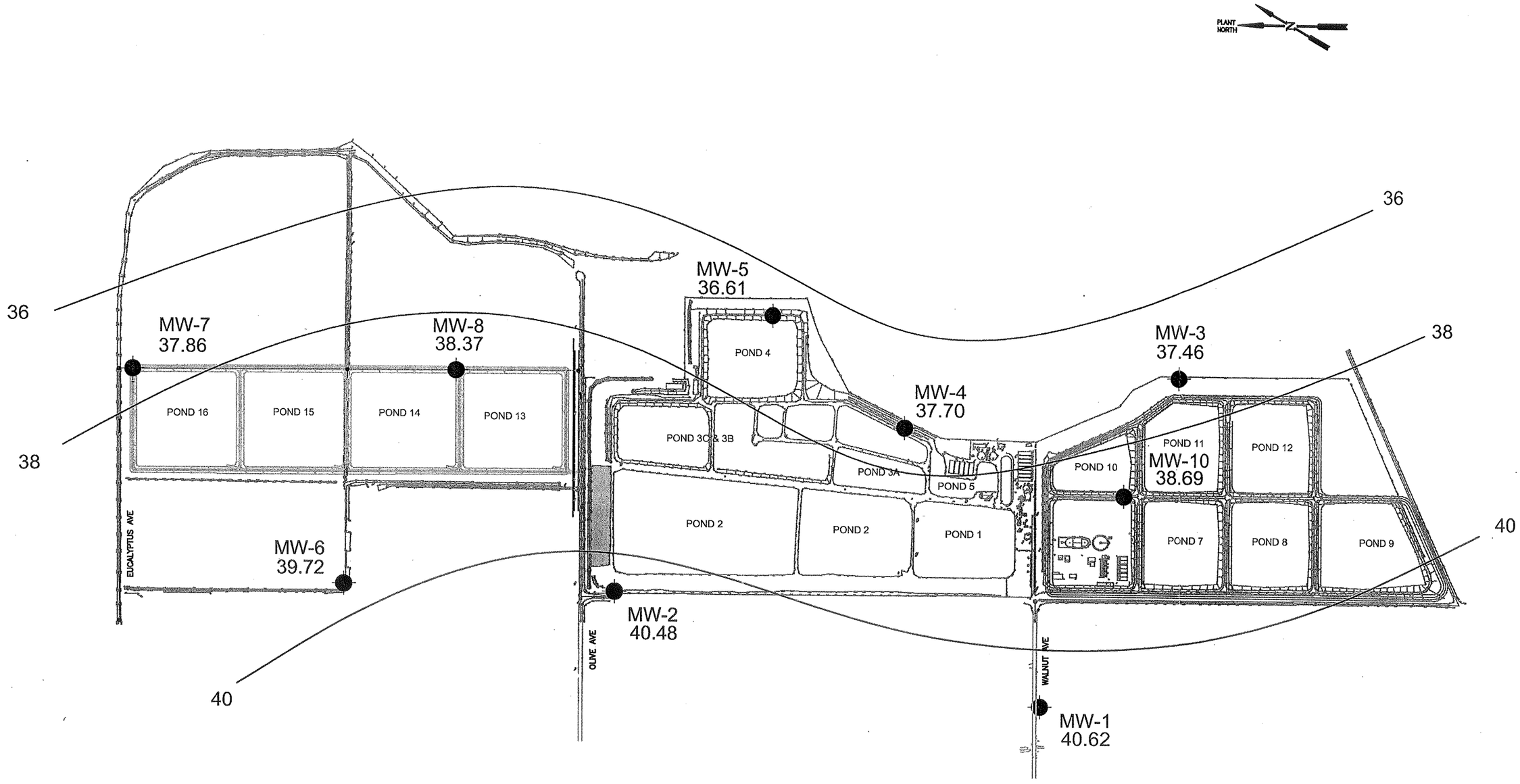
LEE&RO, Inc.
RANCHO CORDOVA, CALIFORNIA

CITY OF PATTERSON
WASTEWATER TREATMENT PLANT
14901 POPLAR AVENUE

FIGURE 1
MONITORING WELL LOCATION MAP
SCALE 1" = 600'

Figure 2
Groundwater Elevations in Patterson WWTP Monitoring Wells





	LEE&RO, Inc. RANCHO CORDOVA, CALIFORNIA	CITY OF PATTERSON WASTEWATER TREATMENT PLANT 14901 POPLAR AVENUE	FIGURE 3 OCTOBER 2005 SAMPLING GROUNDWATER ELEVATION CONTOUR MAP SCALE 1"=600'

APPENDIX A
PURGE LOGS

Measurement of Groundwater Levels

Project Name Patterson WWTP
Location Monitoring Wells
Equipment Type Solinst Water Level Meter
Equipment No. 1

Project No. 721
Recorded By Richard Chrun/GeoAnalytical
Date 10/10/2005
Checked By
Date

Well Number	Time	Reference Point	Reference Elevation	Depth to Water	Water Elevation	Product Thickness	Product Elevation	Adjusted Water Elevation	Depth to Well Bottom	Notes (add below)
MW-1	9:57 AM	TOC	54.93	14.31	40.62	-	-	-	27.52	
MW-2	10:32 AM	TOC	59.68	19.20	40.48	-	-	-	31.28	
MW-3	12.17 PM	TOC	53.80	16.34	37.46	-	-	-	30.88	
MW-4	11:49 AM	TOC	58.58	20.88	37.70	-	-	-	31.64	
MW-5	11:17 AM	TOC	55.21	18.60	36.61	-	-	-	30.50	
MW-6	1:48 PM	TOC	55.23	15.51	39.72	-	-	-	30.00	
MW-7	1:23 PM	TOC	58.04	20.18	37.86	-	-	-	31.50	
MW-8	12:58 PM	TOC	59.33	20.96	38.37	-	-	-	29.50	
MW-10	12:43 PM	TOC	58.12	19.43	38.69	-	-	-	30.00	

Notes:

Report # R281-03

Field Log / Groundwater Sampling Form

Date 10/10/05

Client City of Patterson

Well Name MW-1

Project Name Quarterly Monitoring Wells

Well Type : ☑ Monitor ☐ Extraction ☐ Other

onsultant

Proj. Manager Richard Chrun

Sampler Richard Chrun

WELL PURGING

Purge Method

- ☐ Bailer - Type
- ☒ Pump - Type 2"
- ☐ Other

Total Well Depth 27.50

Depth to Water 14.31

Water Column 13.19

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- ☐ 2 - inch
- ☒ 4 - inch
- ☐ other

Well Volume Purged
- ☒ 3 volumes
- ☐ 4 volumes
- ☐ other

Length 13.19 (Water column length) X 0.6527 (Multiplier) X 3 (No. Volumes) = 25.82 (CALCULATED. Purge Vol.)

25.82 (Purge Vol) / 2.5 (Purge Rate) = 10.33 (TOTAL PURGE TIME)

10.33 (Total Purge Time) / 3 (# Volumes) = 3.44 (PURGE TIME/VOL.)

Actual Values

Purge Time /Vol.	4
X No. Volumes	3
= Total Purge Time	12
X Purge Rate	2.5
= Actual Purge Vol.	30

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. ☐ deg C ☐ deg F	DO	ORP	Color / Odor
Start	9:45	-	-	-	-	-	-	-
Vol 1	9:49	10	7.53	1451 µs	22.0			clear/none
Vol 2	9:53	20	7.73	1391 µs	21.9			"
Vol 3	9:57	30	7.87	1288 µs				"
Vol 4								
Vol 5								

Meter Type

Purge Water Storage / Disposal
- ☒ Drummed onsite
- ☐ Onsite Treatment System
- ☐ Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method
- ☐ Bailer - Type
- ☒ Pump - Type
- ☐ Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
9:57 am	MW-1	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R281-03 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson Well Name MW-2

Project Name Quarterly Monitoring Wells Well Type : ☑ Monitor ☐ Extraction ☐ Other

Consultant

Proj. Manager Richard Chrun Sampler Richard Chrun

WELL PURGING

Purge Method

☐ Bailer - Type
☒ Pump - Type 2"
☐ Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
☐ 2 - inch
☒ 4 - inch
☐ other

Well Volume Purged
☒ 3 volumes
☐ 4 volumes
☐ other

Total Well Depth 31.40
Depth to Water 19.20
Water Column 12.20

Length 12.20 (Water column length) X 0.6527 (Multiplier) X 3 (No. Volumes) = 23.88 (CALCULATED. Purge Vol.)

23.88 (Purge Vol) / 2.5 (Purge Rate) = 9.55 TOTAL PURGE TIME

9.55 (Total Purge Time) / 3 (# Volumes) = 3.18 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	4
X No. Volumes	3
= Total Purge Time	12
X Purge Rate	2.5
= Actual Purge Vol.	30

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. ☑ deg C ☐ deg F	DO	ORP	Color / Odor
Start	10:20	-	-	-	-	-	-	-
Vol 1	10:24	10	7.79	1670 ms	21.3			Clear / none
Vol 2	10:28	20	7.31	1672 ms	20.6			"
Vol 3	10:32	30	7.50	1526 ms	20.9			"
Vol 4								
Vol 5								

Meter Type

Purge Water Storage / Disposal
☒ Drummed onsite
☐ Onsite Treatment System
☐ Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

☐ Bailer - Type
☒ Pump - Type
☐ Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
10:32am	MW-2	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R2281-03

Field Log / Groundwater Sampling Form

Date 10/10/05

Client City of Patterson

Well Name MW-3

Project Name Quarterly Monitoring Wells

Well Type : o Monitor o Extraction o Other

Consultant

Proj. Manager Richard Chrun

Sampler Richard Chrun

WELL PURGING

Purge Method

- [ ] Bailer - Type
- [x] Pump - Type 2"
- [ ] Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- [ ] 2 - inch
- [x] 4 - inch
- [ ] other

Well Volume Purged
- [x] 3 volumes
- [ ] 4 volumes
- [ ] other

Total Well Depth 31.00

Depth to Water 16.34

Water Column 14.66

Length 14.66 (Water column length) x 0.6527 (Multiplier) x 3 (No. Volumes) = 28.70 CALCULATED. Purge Vol.

28.70 (Purge Vol) / 2.5 (Purge Rate) = 11.48 TOTAL PURGE TIME

11.48 (Total Purge Time) / 3 (# Volumes) = 3.82 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	4
X No. Volumes	3
= Total Purge Time	12
X Purge Rate	2.5
= Actual Purge Vol.	30

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. o deg C o deg F	DO	ORP	Color / Odor
Start	12:05	-	-	-	-	-	-	-
Vol 1	12:09	10	7.37	1811 us	21.9			clear / none
Vol 2	12:13	20	7.28	1830 us	22.0			"
Vol 3	12:17	30	7.29	1823 us	22.5			"
Vol 4								
Vol 5								

Meter Type

Purge Water Storage / Disposal
- [x] Drummed onsite
- [ ] Onsite Treatment System
- [ ] Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

- [ ] Bailer - Type
- [x] Pump - Type
- [ ] Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:17am	MW-3	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R881-03 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson **Well Name** MW-4

Project Name Quarterly Monitoring Wells Well Type : ☑ Monitor ☐ Extraction ☐ Other

Consultant

Proj. Manager Richard Chrun **Sampler** Richard Chrun

WELL PURGING

Purge Method

☐ Bailer - Type
☒ Pump - Type 2"
☐ Other

Total Well Depth 31.00
Depth to Water 20.88
Water Column 10.12

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter: ☐ 2 - inch ☒ 4 - inch ☐ other

Well Volume Purged: ☒ 3 volumes ☐ 4 volumes ☐ other

Length 10.12 (Water column length) X 0.6527 (Multiplier) X 3 (No. Volumes) = 19.81 (CALCULATED. Purge Vol.)

19.81 (Purge Vol) / 2.5 (Purge Rate) = 7.92 TOTAL PURGE TIME

7.92 (Total Purge Time) / 3 (# Volumes) = 2.64 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	3
X No. Volumes	3
= Total Purge Time	9
X Purge Rate	2.5
= Actual Purge Vol.	22.5

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. o deg C o deg F	DO	ORP	Color / Odor
Start	11:40	-	-	-	-	-	-	-
Vol 1	11:43	7.5	7.11	1543 µs	21.3			Clear/none
Vol 2	11:46	15.0	7.10	1501 µs	20.6			
Vol 3	11:49	22.5	7.09	1539 µs	20.			
Vol 4								
Vol 5								

Meter Type

Purge Water Storage / Disposal
☒ Drummed onsite
☐ Onsite Treatment System
☐ Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

☐ Bailer - Type
☒ Pump - Type
☐ Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
11:49am	MW-4	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R2281-03 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson **Well Name** MW-5

Project Name Quarterly Monitoring Wells Well Type : ☑ Monitor ☐ Extraction ☐ Other

onsultant

Proj. Manager Richard Chrun **Sampler** Richard Chrun

WELL PURGING

Purge Method

- ☐ Bailer - Type
- ☒ Pump - Type 2"
- ☐ Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- ☐ 2 - inch
- ☒ 4 - inch
- ☐ other

Well Volume Purged
- ☒ 3 volumes
- ☐ 4 volumes
- ☐ other

Total Well Depth 31.00

Depth to Water 18.60

Water Column 12.40

Length 12.40 (Water column length) X 0.6527 (Multiplier) X 3 (No. Volumes) = 24.28 (CALCULATED. Purge Vol.)

24.28 (Purge Vol) / 2.5 (Purge Rate) = 9.71 TOTAL PURGE TIME

9.71 (Total Purge Time) / 3 (# Volumes) = 3.23 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	4
X No. Volumes	3
= Total Purge Time	12
X Purge Rate	2.5
= Actual Purge Vol.	30

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. ☑ deg C ☐ deg F	DO	ORP	Color / Odor
Start	11:05	-	-	-	-	-	-	-
Vol 1	11:09	10	7.49	1491 µs	19.8			clear / none
Vol 2	11:13	20	7.13	1461 µs	19.3			
Vol 3	11:17	30	7.00	1398 µs	19.2			
Vol 4								
Vol 5								

Meter Type

Purge Water Storage / Disposal
- ☒ Drummed onsite
- ☐ Onsite Treatment System
- ☐ Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method
- ☐ Bailer - Type
- ☒ Pump - Type
- ☐ Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
11:17 am	MW-5	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # Q281-05 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson **Well Name** MW-6

Project Name Quarterly Monitoring Wells Well Type : o Monitor o Extraction o Other

Consultant

Proj. Manager **Sampler** Richard Chrun

WELL PURGING

Purge Method

- [ ] Bailer - Type
- [x] Pump - Type 2"
- [ ] Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- [x] 2 - inch
- [ ] 4 - inch
- [ ] other

Well Volume Purged
- [x] 3 volumes
- [ ] 4 volumes
- [ ] other

Total Well Depth 29.20

Depth to Water 15.51

Water Column 13.69

Length 13.69 (Water column length) X 0.1632 (Multiplier) X 3 (No. Volumes) = 6.70 (CALCULATED. Purge Vol.)

6.70 (Purge Vol) / 2.5 (Purge Rate) = 2.23 (TOTAL PURGE TIME)

2.23 (Total Purge Time) / 3 (# Volumes) = 0.74 (PURGE TIME/VOL.)

Actual Values

Purge Time /Vol.	1
X No. Volumes	3
= Total Purge Time	3
X Purge Rate	2.5
= Actual Purge Vol.	7.5

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. o deg C o deg F	DO	ORP	Color / Odor
Start	1:45	-	-	-	-	-	-	-
Vol 1	1:46	2.5	7.85	1482 us	22.3			Brown / none
Vol 2	1:47	5.0	7.52	1448 us	21.6			"
Vol 3	1:48	7.5	7.50	1456 us	21.4			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal
- [x] Drummed onsite
- [ ] Onsite Treatment System
- [ ] Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method
- [ ] Bailer - Type
- [x] Pump - Type
- [ ] Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
1:48 pm	MW-6	X				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R2281-03 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson Well Name MW-7

Project Name Quarterly Monitoring Wells Well Type : ✓ Monitor o Extraction o Other

Consultant

Proj. Manager Sampler Richard Chrun

WELL PURGING

Purge Method

- [ ] Bailer - Type
- [x] Pump - Type 2"
- [ ] Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- [x] 2 - inch
- [ ] 4 - inch
- [ ] other

Well Volume Purged
- [x] 3 volumes
- [ ] 4 volumes
- [ ] other

Total Well Depth 31.00

Depth to Water 20.18

Water Column 10.82

Length 10.82 (Water column length) X 0.1632 (Multiplier) X 3 (No. Volumes) = 5.29 (CALCULATED. Purge Vol.)

5.29 (Purge Vol) / 2.5 (Purge Rate) = 2.11 TOTAL PURGE TIME

2.11 (Total Purge Time) / 3 (# Volumes) = 0.70 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	1
X No. Volumes	3
= Total Purge Time	3
X Purge Rate	2.5
= Actual Purge Vol.	7.5

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. o deg C o deg F	DO	ORP	Color / Odor
Start	1:20	-	-	-	-	-	-	-
Vol 1	1:21	2.5	7.56	1707 us	21.1			Brown / none
Vol 2	1:22	5.0	7.37	1697 us	20.6			turbid / none
Vol 3	1:23	7.5	7.28	1628 us	20.9			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal
- [x] Drummed onsite
- [ ] Onsite Treatment System
- [ ] Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

- [ ] Bailer - Type
- [x] Pump - Type
- [ ] Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
1:23pm	MW-7	x				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R281-05 **Field Log / Groundwater Sampling Form** Date 10/10/05

Client City of Patterson **Well Name** MW-8

Project Name Quarterly Monitoring Wells Well Type: ☒ Monitor ☐ Extraction ☐ Other

Consultant

Proj. Manager **Sampler** Richard Chrun

WELL PURGING

Purge Method

☐ Bailer - Type
☒ Pump - Type 2"
☐ Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
☒ 2 - inch
☐ 4 - inch
☐ other

Well Volume Purged
☒ 3 volumes
☐ 4 volumes
☐ other

Total Well Depth 30.70
Depth to Water 20.96
Water Column 9.74

Length 9.74 (Water column length) X 0.1632 (Multiplier) X 3 (No. Volumes) = 4.76 (CALCULATED. Purge Vol.)

4.76 (Purge Vol) / 2.5 (Purge Rate) = 1.90 TOTAL PURGE TIME

1.90 (Total Purge Time) / 3 (# Volumes) = 0.63 PURGE TIME/VOL.

Actual Values

Purge Time /Vol.	1
X	
No. Volumes	3
=	
Total Purge Time	3
X	
Purge Rate	2.5
=	
Actual Purge Vol.	7.5

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. ☒ deg C ☐ deg F	DO	ORP	Color / Odor
Start	12:55	-	-	-	-	-	-	-
Vol 1	12:56	2.5	7.10	1634 us	21.4			turbid / none
Vol 2	12:57	5.0	7.18	1540 us	20.2			"
Vol 3	12:58	7.5	7.52	1530 us	20.1			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal
☒ Drummed onsite
☐ Onsite Treatment System
☐ Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

☐ Bailer - Type
☒ Pump - Type
☐ Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:58 pm	MW-8	x				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

Report # R2281-03

Field Log / Groundwater Sampling Form

Date 10/10/05

Client City of Patterson

Well Name MW-10

Project Name Quarterly Monitoring Wells

Well Type : o Monitor o Extraction o Other

Consultant

Proj. Manager

Sampler ~~MW~~ Richard Chrun

WELL PURGING

Purge Method

- [ ] Bailer - Type
- [x] Pump - Type 2"
- [ ] Other

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter
- [x] 2 - inch
- [ ] 4 - inch
- [ ] other

Well Volume Purged
- [x] 3 volumes
- [ ] 4 volumes
- [ ] other

Total Well Depth 30.00

Depth to Water 19.43

Water Column 10.57

Length 10.57 (Water column length) X 0.1632 (Multiplier) X 3 (No. Volumes) = 5.17 (CALCULATED. Purge Vol.)

5.17 (Purge Vol) / 2.5 (Purge Rate) = 2.07 (TOTAL PURGE TIME)

2.07 (Total Purge Time) / 3 (# Volumes) = 0.69 (PURGE TIME/VOL.)

Actual Values

Purge Time /Vol.	1
X No. Volumes	3
= Total Purge Time	3
X Purge Rate	2.5
= Actual Purge Vol.	7.5

GROUNDWATER PARAMATER MEASUSREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. o deg C o deg F	DO	ORP	Color / Odor
Start	12:40	-	-	-	-	-	-	-
Vol 1	12:41	2.5	7.47	1716 us	21.9			Brown / none
Vol 2	12:42	5.0	7.26	1648 us	22.2			"
Vol 3	12:43	7.5	7.21	1502 us				"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal
- [x] Drummed onsite
- [ ] Onsite Treatment System
- [ ] Other

COMMENTS/purge:

WELL SAMPLING

Sampling Method

- [ ] Bailer - Type
- [x] Pump - Type
- [ ] Other

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:43pm	MW-10	x				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling:

1405 Kansas Ave.
Modesto, CA 95351

GeoAnalytical Laboratories, Inc.
Cert# 1157

Phone: (209) 572-0900
Fax: : (209) 572-0916

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone: (209) 572-0900
Fax: (209) 572-0916

Lab Report # R2064-03

Regulatory ☐ Yes ☐ No CC: ☐ Yes ☐ No

Regulator: _____

Phone: (209) 892-8886

Fax: (209) 892-8993

Original To: Joel Cockrell

C.C To: Bob Goodwin

Client: City of Patterson

Address: 33 S. Del Puerto

City Patterson, CA Zip 95363

CHAIN OF CUSTODY

☐ EDF ☐ EDT

☐ FIELD LOGS

Project ID Quarterly Monitoring Wells

Sampled By (Print Name) Richard Chrun

(Signature) Richard Chrun

Date	Time	Sample type Grab	Sample type Comp	Matrix	Sample ID	Container Type	Container Size	No. Of Containers	ANALYSIS pH, EC, TDS	ANALYSIS NO3 as N	ANALYSIS Bacteria	Remarks	Lab Use Only Lab ID #	Lab Use Only Preservative
10-10-05	9:57am	X		WW	mw-1	P	100ml/L	2	X	X	X		R2064456	
	10:32am				mw-2								R2064457	
	12:17pm				mw-3								R2064458	
	11:49am				mw-4								R2064459	
	11:17am				mw-5								R2064460	
	1:48pm				mw-6								R2064461	
	1:23pm				mw-7								R2064462	
	12:58pm				mw-8								R2064463	
	12:43pm				mw-10								R2064464	
	~~10:46am~~	X		WW	Mitigation Well (NO SAMPLE)	P	100ml/L	2	X	X	X			

Remarks

Relinquished by (Signature)	Date	Time	Received by (Signature)	Date	Time
Richard Chrun	10-10-05	2:00pm		10-10	2:06
Relinquished by (Signature)	Date	Time	Received by (Signature)	Date	Time

Preservative: 1 4°C 2 HCL 3 NaOH 4 $Na_2S_2O_3$ 5 HNO_3 6 H_2SO_4 7 Other _____

Matrix: DW Drinking Water WW Waste Water HWW Hazardous Waste (Water) S Soil/Solid

Bailers ___ ___ 55 Gallon Drums _____

Pump Truck ☒ Time 1 day Mileage 37 les

Approved By: _____

Turnaround Time ☐ Standard ☐ Silver Rush ☐ Gold Rush ☐ Platinum Rush ☐ Other

APPENDIX B
LABORATORY ANALYTICAL REPORT

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # R283-03

Date: 10/17/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Project: Quarterly Monitoring Wells

PO#

RECEIVED
OCT 20 2005
BY:

Date Rec'd: 10/10/05
Date Started: 10/10/05
Date Completed: 10/12/05

Date Sampled: 10/10/05
Time:
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
MW-1	R306456	NA	150.1	pH	7.3	Std. Units
		1.0	120.1	Specific Conductance (EC)	1860	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1140	mg/L
		0.25	300.0	Nitrate as N	8.4	mg/L
MW-2	R306457	NA	150.1	pH	6.8	Std. Units
		1.0	120.1	Specific Conductance (EC)	3400	µmhos/cm
		10	160.1	TDS (Filterable Residue)	2000	mg/L
		0.25	300.0	Nitrate as N	10	mg/L
MW-3	R306458	NA	150.1	pH	7.0	Std. Units
		1.0	120.1	Specific Conductance (EC)	3820	µmhos/cm
		10	160.1	TDS (Filterable Residue)	2200	mg/L
		0.25	300.0	Nitrate as N	7.5	mg/L
MW-4	R306459	NA	150.1	pH	6.8	Std. Units
		1.0	120.1	Specific Conductance (EC)	2780	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1490	mg/L
		0.25	300.0	Nitrate as N	2.9	mg/L
MW-5	R306460	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	2750	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1540	mg/L
		0.25	300.0	Nitrate as N	6.3	mg/L

Rohit Bombaywala
Inorganic Supervisor

Certification # 2585

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # R283-03 **Date:** 10/17/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Project: Quarterly Monitoring Wells

PO#

Date Rec'd: 10/10/05
Date Started: 10/10/05
Date Completed: 10/12/05

Date Sampled: 10/10/05
Time:
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
MW-6	R306461	NA	150.1	pH	7.1	Std. Units
		1.0	120.1	Specific Conductance (EC)	2420	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1420	mg/L
		0.25	300.0	Nitrate as N	6.1	mg/L
MW-7	R306462	NA	150.1	pH	6.9	Std. Units
		1.0	120.1	Specific Conductance (EC)	2840	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1620	mg/L
		0.25	300.0	Nitrate as N	8.4	mg/L
MW-8	R306463	NA	150.1	pH	7.0	Std. Units
		1.0	120.1	Specific Conductance (EC)	3100	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1870	mg/L
		0.25	300.0	Nitrate as N	6.1	mg/L
MW-10	R306464	NA	150.1	pH	7.0	Std. Units
		1.0	120.1	Specific Conductance (EC)	3180	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1790	mg/L
		0.25	300.0	Nitrate as N	4.7	mg/L

Rohit Bombaywala
Inorganic Supervisor

Certification # 2585

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # R283-03 **Date:** 10/13/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Project: Quarterly Monitoring Wells

PO#

Date Rec'd: 10/10/05
Date Started: 10/10/05
Date Completed: 10/13/05

Date Sampled: 10/10/05
Time:
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
MW-1	R306456	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-2	R306457	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-3	R306458	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-4	R306459	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-5	R306460	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-6	R306461	2	SM9221B,C	Total Coliform	>1600	MPN/100ml
		2	SM9221E,C	Fecal Coliform	>1600	MPN/100ml
MW-7	R306462	2	SM9221B,C	Total Coliform	<2	MPN/100ml
MW-8	R306463	2	SM9221B,C SM9221E,C	Total Coliform	<2	MPN/100ml
MW-10	R306464	2	SM9221B,C	Total Coliform	<2	MPN/100ml

Kanti Gandhi
Chemist

Certification # 2585

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

QC REPORT

Report# R283-03

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Analyte	Method	Batch #	Dates Analyzed	Orig.	Dupl.	MS %Rec	MSD %Rec	RPD	LCS %Rec	Blank	Comments
Total Coliform	SM9221B,C	B0326	10/10/05-10/13/05	<2	<2			0.0		<2	

* **LCS/LCSD** (see comments)

Kanti Gandhi
Chemist

Certification # 2585

Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

Report# R283-03

QC REPORT

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Analyte	Method	Batch #	Dates Analyzed	Orig.	Dupl.	MS %Rec	MSD %Rec	RPD	LCS %Rec	Blank	Comments
pH	150.1	IO5820	10/10/05	7.3	7.3			0.0		NA	
Specific Conductance (EC)	120.1	IO5818	10/11/05	1860	1860			0.0		ND	
TDS (Filterable Residue)	160.1	IO5790	10/10/05	1140	1139			0.1		ND	
Nitrate as N	300.0	IO5877	1019/2/06			102.9	109.7	6.4	90.4	ND	

*** LCS/LCSD** (see comments)

Rohit Bombaywala
Inorganic Supervisor

Certification # 2585

Donna Keller
Laboratory Director