



# STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION  
BUREAU OF CORRECTIVE ACTIONS

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Jim Gibbons, Governor

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Leo M. Drozdoff, P.E., Administrator

Hermann Kishner Trust  
Mr. Irwin Kishner, trustee  
294 Convention Center Drive  
Las Vegas, NV 89109

**Subject: Groundwater Monitoring Report, 4<sup>th</sup> Quarter 2008, Maryland Square Shopping Center**

**Facility:** Al Phillips the Cleaner (former)  
3661 S. Maryland Pkwy  
Las Vegas, NV

**NDEP ID#: H-000086**

Dear Mr. Kishner:

The Nevada Division of Environmental Protection (NDEP) has reviewed the quarterly groundwater monitoring report provided by your environmental consultant, Converse Consultants (Converse), and received on December 12, 2008. The NDEP notes that sampling followed the frequency schedule set forth in the NDEP letter of December 24, 2007, and reiterated on page 4 of the Groundwater Monitoring Report.

## NDEP Comments

The "Conclusions" section of the Groundwater Monitoring Report for the 4<sup>th</sup> Quarter of 2008 states that:

- (1) The average depth to groundwater is 19.08 feet below ground surface (bgs)
- (2) Concentrations of tetrachloroethylene (PCE) ranged from 2 to 2,600 micrograms per liter ( $\mu\text{g/L}$ ) across the plume
- (3) NDEP conducted the Mann-Kendall trend test and found that the current condition of the plume is "stable" (i.e., no statistically significant increasing or decreasing trend at the 90% confidence level).

1. The NDEP notes that the depth to groundwater ranges from 11.96 (MW-18) to 27.19 ft bgs (MW-16) across the 33 wells over a distance of about 4,000 linear ft (source area to farthest downgradient well), so reporting the "average" depth to groundwater is not a particularly helpful observation.

2. The range of PCE concentrations is an interesting observation, but it is not a conclusion.

3. The NDEP's latest statistical analysis is attached to this letter. The free program (an Excel macro) to conduct the Mann-Kendall trend test is available on the Washington State Department of Ecology website at [http://www.ecy.wa.gov/programs/tcp/policies/pol\\_main.html](http://www.ecy.wa.gov/programs/tcp/policies/pol_main.html) under "Package A" for the natural attenuation analysis tool. Based on the results of this round of testing, one may conclude that the current plume configuration is stable.

The NDEP notes that the PCE concentrations measured in groundwater samples collected by Converse are closely comparable to those measured in the samples collected by the previous consultant (URS Corporation). URS switched to "low-flow" sampling in September 2007 and Converse is continuing with this sampling method, which is described on page four of the subject report.



## NDEP Requirements

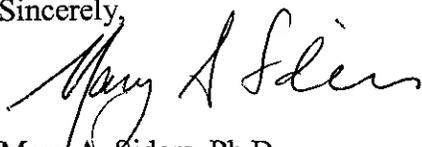
The NDEP requests that you provide the statistical analysis of plume stability and provide the results in the next quarterly report. The Excel macro from the Washington State Department of Ecology is an easy-to-use program that set up to run the Mann-Kendall trend test.

Please provide quarterly reports on the following schedule:

Groundwater Monitoring Report for First Quarter, 2009	April 22, 2009
Groundwater Monitoring Report for Second Quarter, 2009	July 22, 2009
Groundwater Monitoring Report for Third Quarter, 2009	October 22, 2009
Groundwater Monitoring Report for Fourth Quarter, 2009	January 20, 2010

Finally, the NDEP requests that, for upcoming reports, the background on the photographic maps (Plates 1 through 3) be substantially faded out, so that the hydraulic gradients, plume boundaries, well locations, and other labels are more easily readable on these figures. The NDEP posts reports for Maryland Square on our website: <http://www.ndep.nv.gov/pce/foia.htm>, so submittal of electronic "print-to-pdf" files is appreciated.

Sincerely,



Mary A. Siders, Ph.D.  
Bureau of Corrective Actions

Enclosure (One attachment of 4 pages)

cc: w/enc Andrea Havens, Converse Consultants, 731 Pilot Road Suite H, Las Vegas, NV 89119

cc: w/o enc Greg Lovato, Supervisor, Bureau of Corrective Actions, NDEP, Carson City  
Todd Croft, BCA, NDEP, Las Vegas  
William Frey, State of Nevada, Office of the Attorney General, 100 N. Carson Street, Carson City, NV 89701  
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Lynne S. Stella, Manager of Environmental Services, General Growth Properties, Inc., 110 N. Wacker Drive, Chicago, IL 60606

**Results of Mann-Kendall Trend Test (Data through November 2008)<sup>1</sup>**

Well ID	Trend at 90% Confidence	Number of Samples	Sampling Frequency Recommended	Monitoring Well Area
MW-1	Decreasing	11	S	Onsite
MW-2	Decreasing	10	S	West side of mall
MW-3	6.5 µg/L		A	South of plume, on west side of mall
MW-4	ns		S	Onsite, south of plume
MW-5	Stable	10	S	Onsite, south of plume
MW-6	Stable	11	S	Onsite
MW-7	2.5 µg/L		A	Onsite, upgradient, north of plume
MW-8	3.7 µg/L		A	Onsite, upgradient
MW-9	Undetermined	10	S	Deeper well
MW-10	12 µg/L		A	Quarterly
MW-11	ns		Discontinued	NS (old TPH in well)
MW-12	2.0 µg/L		A	Onsite, upgradient
MW-13	Decreasing	14	S	West side of mall, in plume centerline
MW-14	Decreasing	12	S	Onsite, in plume centerline
MW-15	7.8 µg/L		A	North of plume, on west side of mall
MW-16	ND		A	East of mall, below detection limits
MW-17	Decreasing	9	S	Onsite
MW-18	Decreasing	13	Q	Westernmost well in neighborhood
MW-19	Stable	12	S	East mall parking lot
MW-20	Stable	14	Q	East mall parking lot
MW-21	Stable	11	A	North edge of plume, east side of mall
MW-22	ns		A	Neighborhood, north of plume, NDs
MW-23	Decreasing	12	Q	Seneca Circle, in neighborhood
MW-24	6.1 µg/L		A	Ottawa Drive, south of Seneca Circle
MW-25	Decreasing	13	Q	Seneca Lane
MW-26	Stable	10	Q	Seneca Lane
MW-27	Stable	10	Q	Ottawa Circle, next to Golf Course
MW-28	na	3	S	Ottawa Dr & Ottawa Circle
MW-29	na	3	S	East end of Ottawa Dr
MW-30	Stable	4	Q	Geronimo Way cul de sac
MW-31	na	3	na	Intersection of Cochise and Tioga
MW-32	na	3	na	Intersection of Cherokee and Spencer
MW-33	na	3	na	Intersection of Comanche and Spencer

Notes:

<sup>1</sup>Switched to low-flow sampling in September 2007. During the first low-flow sampling event, data showed deviation from other sampling events. As a result, data from the September 2007 sampling event have been excluded from this analysis. Results from Mann-Kendall test for trend test at 90% confidence level.

"na" indicates that statistical testing was not conducted due to low rate of detection or fewer than four samples collected; "ns" means not sampled in this event; "ND" means not detected.

µg/L = Micrograms per liter

A = annual sampling; S = semi-annual sampling; Q = quarterly sampling

**Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)**

Site Name: *Maryland Square PCE Site*

Site Address: *Las Vegas, NV*

Additional Description:

Well (Sampling) Location? **MS**

Level of Confidence (Decision Criteria)? **90%**

**1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

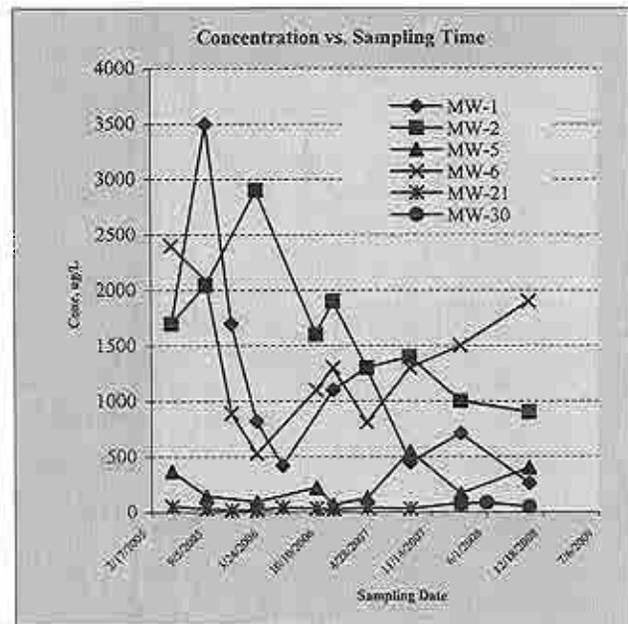
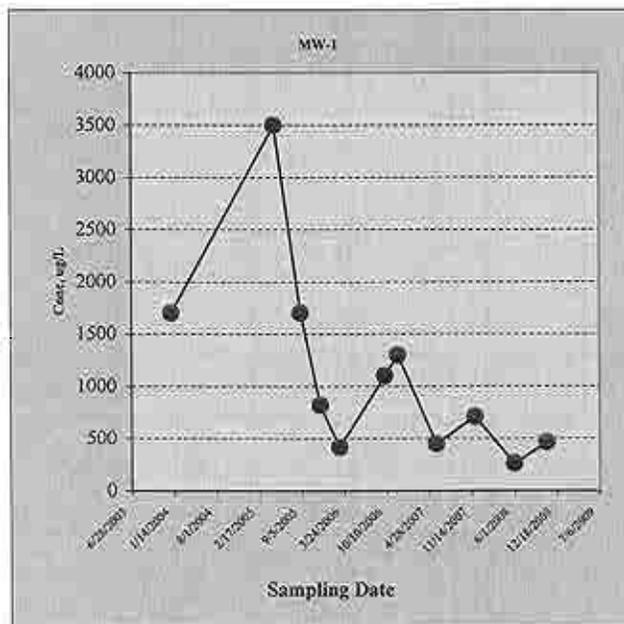
Sampling Event	Date Sampled	Hazardous Substances (unit is ug/L)					
		MW-1	MW-2	MW-5	MW-6	MW-21	MW-30
#1	Jan-04	1700	1700	370	2400	55	
#2	May-05	3500	2050	146	2090	30	
#3	Sep-05	1700			890	19	
#4	Dec-05	820	2900	93	530	16	
#5	Mar-06	420				43	
#6	Jun-06		1600	220	1100	32	
#7	Oct-06	1100	1900	67	1300	23	
#8	Dec-06	1300	1300	130	810	39	
#9	Apr-07						
#10	Jun-07	450	1400	550	1300	28	
#11	Sep-07						
#12	Dec-07	710	1000	170	1500	83	74
#13	Mar-08						86
#14	Jun-08	260	900	400	1900		49
#15	Nov-08	460	960	340	2000	20	100
#16							

**2. Mann-Kendall Non-parametric Statistical Test Results**

Hazardous Substance?	MW-1	MW-2	MW-5	MW-6	MW-21	MW-30
Confidence Level Calculated?	98.70%	99.80%	75.80%	67.60%	50.00%	62.50%
Plume Stability?	Shrinking	Shrinking	Stable	Stable	Stable	Stable
Coefficient of Variation?			CV <= 1	CV <= 1	CV <= 1	CV <= 1
Mann-Kendall Statistic "S" value?	-30	-31	9	8	-1	2
Number of Sampling Rounds?	11	10	10	11	11	4
Average Concentration?	1129.09	1571.00	248.60	1438.18	35.27	77.25
Standard Deviation?	934.95	612.25	158.34	596.25	19.63	21.62
Coefficient of Variation?	0.83	0.39	0.64	0.41	0.56	0.28
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**3. Temporal Trend: Plot of Concentration vs. Sampling Time**

Hazardous substance? **MW-1**  
 Plume Stability? **Shrinking**



**Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)**

Site Name: Maryland Square PCE Site

Site Address: Las Vegas, NV

Additional Description:

Well (Sampling) Location? MS

Level of Confidence (Decision Criteria)? 90%

**1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

Sampling Event	Date Sampled	Hazardous Substances (unit is ug/L)					
		MW-13	MW-14	MW-17	MW-18	MW-19	MW-9 inter
#1	Jan-04	2700	2100			1200	10
#2	May-05	5310	2920	520	1600	870	353
#3	Sep-05	2600			1700		64
#4	Dec-05	3400	3400	470	2400	1300	190
#5	Mar-06	3700	2500		1700		1
#6	Jun-06	2900	1800		1600	910	
#7	Oct-06	2800	1900	1300	2100	840	160
#8	Dec-06	3200	3500	710	1400	1200	45
#9	Mar-07	2500	1900	440	1400	890	
#10	Jun-07	3700	1700	300	1300	870	
#11	Sep-07	2000					
#12	Dec-07	2500	1500	480	1400	990	110
#13	Mar-08				1800	1200	
#14	Jun-08	2300	1500	360	1200	930	6
#15	Nov-08	2600	1500	290	950	1300	12
#16							

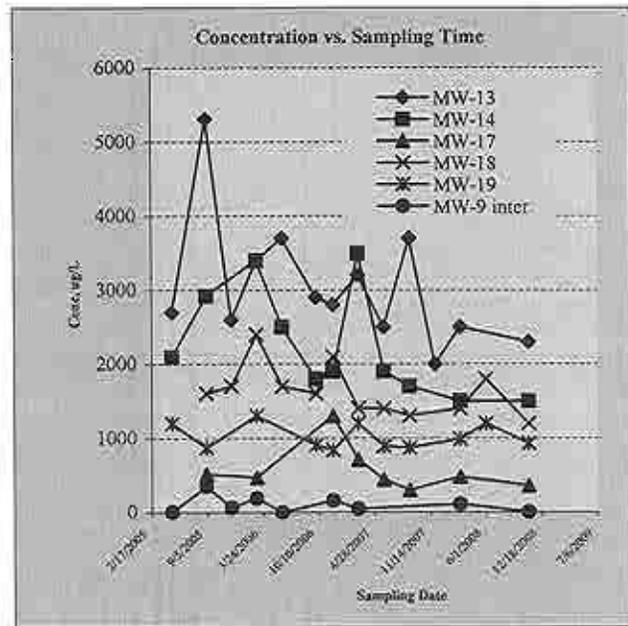
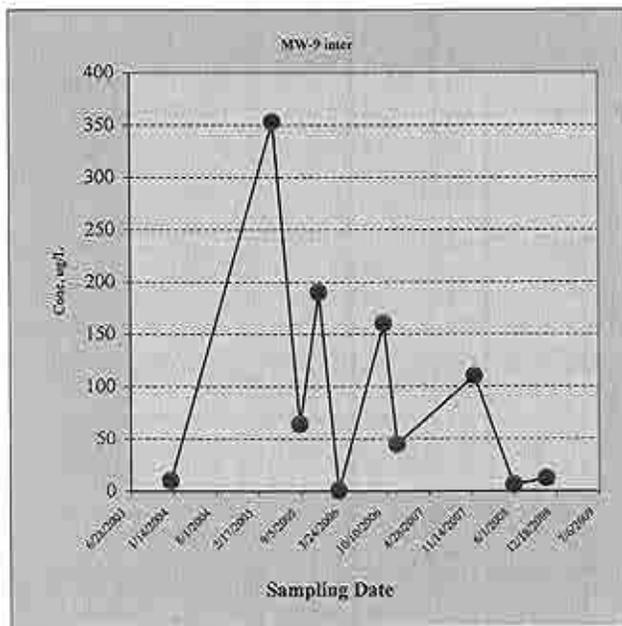
**2. Mann-Kendall Non-parametric Statistical Test Results**

Hazardous Substance?	MW-13	MW-14	MW-17	MW-18	MW-19	MW-9 inter
Confidence Level Calculated?	96.00%	99.60%	97.80%	98.90%	68.10%	81.00%
Plume Stability?	Shrinking	Shrinking	Shrinking	Shrinking	Stable	Undetermined
Coefficient of Variation?					CV <= 1	CV > 1
Mann-Kendall Statistic "S" value?	-34	-38	-20	-39	9	-11
Number of Sampling Rounds?	14	12	9	13	12	10
Average Concentration?	3015.00	2185.00	541.11	1580.77	1041.67	95.10
Standard Deviation?	830.34	726.49	311.83	380.54	181.85	112.73
Coefficient of Variation?	0.28	0.33	0.58	0.24	0.17	1.19
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**3. Temporal Trend: Plot of Concentration vs. Sampling Time**

Hazardous substance? MW-9 inter

Plume Stability? Undetermined



**Module1: Mann-Kendall Trend Test for Plume Stability (Non-parametric Statistical Test)**

Site Name: Maryland Square PCE Site  
 Site Address: Las Vegas, NV  
 Additional Description: \_\_\_\_\_

Well (Sampling) Location? MS  
 Level of Confidence (Decision Criteria)? 90%

**1. Monitoring Well Information: Contaminant Concentration at a well: Quarterly sampling recommended.**

		Hazardous Substances (unit is ug/L)					
Sampling Event	Date Sampled	MW-20	MW-23	MW-25	MW-26	MW-27	MW-18
#1	Nov-03	1800					
#2	Jan-04	290					
#3	May-05	1460	1430	993			1600
#4	Sep-05			920			1700
#5	Dec-05	1800	1900	1000			2400
#6	Mar-06			970	730	220	1700
#7	Jun-06	2100	1500	960	770	350	1600
#8	Oct-06	2000	2000	1300	1100	380	2100
#9	Dec-06	2500	2100	1200		380	1400
#10	Mar-07	1500	2100	670	790	160	1400
#11	Jun-07	1300	1300	960	960	340	1300
#12	Dec-07	1400	1200	780	910	430	1400
#13	Mar-08	1600	1400	890	1100	580	1800
#14	Jun-08	1200	1100	630	930	320	1200
#15	Nov-08	1000	1300	730	900	510	950
#16							

**2. Mann-Kendall Non-parametric Statistical Test Results**

Hazardous Substance?	MW-20	MW-23	MW-25	MW-26	MW-27	MW-18
Confidence Level Calculated?	84.70%	91.80%	97.90%	82.10%	89.20%	98.90%
Plume Stability?	Stable	Shrinking	Shrinking	Stable	Stable	Shrinking
Coefficient of Variation?	CV <= 1			CV <= 1	CV <= 1	
Mann-Kendall Statistic "S" value?	-19	-19	-35	11	16	-39
Number of Sampling Rounds?	13	11	13	9	10	13
Average Concentration?	1534.62	1575.45	923.31	910.00	367.00	1580.77
Standard Deviation?	550.77	375.80	192.20	133.04	123.74	380.54
Coefficient of Variation?	0.36	0.24	0.21	0.15	0.34	0.24
Blank if No Errors found						

**3. Temporal Trend: Plot of Concentration vs. Sampling Time**

Hazardous substance? MW-27  
 Plume Stability? Stable

