CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

TECHNICAL MEMORANDUM

REGISTERED GEOLOGIST
CERTIFICATE NO. 26036
DONALD P. HANSON
Date Signed 2-13-06
ARIZONA, U.S.A.

TO: William McCarthy, P.E. – City of Mesa
DATE: February 13, 2006
FROM: Don Hanson
RE: Las Sendas/Spook Hill Hydrologic Seepage Study

This memorandum has been prepared to summarize the results of an initial evaluation for two different but potentially related problems at the Las Sendas development located near Power and Thomas Roads in northeast Mesa, Arizona (Figure 1). Specifically, the problems relate to subsurface water migrating into basements at two different houses and visible seepage along the east bank of the Spook Hill Floodway operated by the Maricopa County Flood Control District (MCFCD). This work was conducted in accordance with our proposal dated July 14, 2005.

To further assess the nature and occurrence of seepage water at both locations, Clear Creek Associates conducted the following activities:

- Reviewed City of Mesa water distribution maps, the results of a leak detection report prepared by Detection Specialties, Inc. dated July 9, 2002, and water quality data provided by the City;
- Reviewed pre- and post-development topographic maps for the area;
- Reviewed a Maricopa County Flood Control District Interoffice Memorandum dated April 8, 2005 regarding Spook Hill Floodway Seepage;
- Conducted a site visit on October 4, 2005 to assess the physical conditions; and
- Prepared this report summarizing our findings and conclusions.

The Las Sendas development is located in the northeast corner of Mesa's City limits. The development is located within the foothills of the Usery Mountains and is bordered on the west by the Central Arizona Project (CAP) canal and the Spook Hill Floodway (SHFW). The Usery Mountains are comprised of early protorozoic granitic rocks including granite, granite diorite, quartz diorite, and gabbro. Bedrock outcrops are visible within the Las Sendas development including Spook Hill and smaller un-named outcrops. Sometime after the site was developed, two homes (initially lot #11 and subsequently lot #42) with subgrade basements had problems with water seepage. The MCFCD also identified seepage emerging from the base of the east bank of the SHFW north of the Spook Hill outcrop. Figure 2 illustrates the location of the two lots and the reported SHFW seepage.

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

LEAK DETECTION MONITORING

To evaluate the potential for a water main leak contributing to the observed seepage, the City subcontracted Detection Specialties, Inc. (DSI) to perform water system leak detection monitoring by testing various valves, curb stops, and other fittings as well as pressure testing portions of the system. The results DSI's leak detection monitoring identified one small leak at a hydrant in the Pinnacle Point area of Las Sendas. The report, dated July 10, 2002 states that it is not likely that this leak is contributing to the seepage at Lot #11. The hydrant is located over 1,200 feet away from Lot #11 and Clear Creek would concur that the hydrant would not be considered a likely source of the seepage water. A copy of the July 10, 2002 leak detection report is attached.

WATER QUALITY ANALYSIS

Four water quality samples were collected in August 2004 by City of Mesa personnel and analyzed by the City's Compliance Laboratory. Samples were analyzed for select metals and general ions (both cations and anions). Copies of the analytical laboratory reports are attached. Sample locations included:

- Las Sendas Golf Course Lake
- The sump located at Lot #11 (3821 N. Rowen Circle)
- CAP Water Treatment Plant (WTP) Influent
- CAP WTP Potable Effluent

The water quality data were evaluated through the use of a tri-linear (Piper) plot. Tri-linear plots allow for a direct visual comparison of chemical signatures from different water samples. Concentrations of the common cations (calcium, magnesium, sodium, and potassium) and common anions (chloride, sulfate, and alkalinity) are converted from milligrams per liter (mg/L) to milliequivalents. The resultant percentages (by weight) for each sample are then plotted on their respective graphs and projected onto a common water quality plot. Samples that overlap represent similar water types. Figure 3 illustrates a tri-linear diagram and plots for the four water samples.

The results indicate similar water quality for the raw influent and treated potable effluent from the CAP WTP. Similar water quality was also noted for the water sample collected from the Las Sendas Lake. This similarity would be expected as these three waters are essentially from the same source (CAP). However, the sample collected from the sump at Lot #11 shows a different chemical signature.

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

While these results do not confirm a separate and distinct water source for the sump water, they do indicate chemical alteration, which would not likely occur if the source of the water were from a leaking water line.

Additional review of the data indicates that the sump sample has elevated chloride, sulfate and nitrate concentrations. While chloride and possibly sulfate may be explained by water interactions with native soils, the elevated nitrate levels (5.65 mg/L) are more likely related to fertilizer application on the golf course given that the native desert soils (primarily decomposed granite) have limited organic matter. This in turn suggests that excess applied golf course irrigation may be resulting in the accumulation of subsurface water.

TOPOGRAPHIC MAP REVIEW

Clear Creek Associates reviewed topographic maps for the area using the Windows based computer program TOPO ©2000. Figure 4 illustrates the area topography prior to development. Clear Creek enhanced the image by highlighting major and minor mountain front drainages. As illustrated on Figure 4, several major drainages were present, which drained water from the higher elevations of the Usery Mountains west through what is now the Las Sendas development. Clear Creek also plotted the locations of lots #11 and #42 on the historical topographic map (see Figure 5). Lot #11 sits directly on a minor drainage and lot #42 sits directly on a major drainage. Using the topographic map, Clear Creek estimated a pre-development elevation for each lot. Given the nature of the area, these pre-development elevations can be correlated with the approximate elevation of the bedrock surface. Elevations are shown on Figure 5. Clear Creek also established a post-development elevation for the two lots. Figure 6 illustrates the post-development lot elevations along with the pre-development drainages. Both post-development lot elevations appear to be about 10 feet above the former bedrock surface.

Using the post-development topography, Clear Creek Associates developed a surface drainage map. Figure 7 illustrates the surface drainage pattern based on post-development contours (post-development contours are based on the Maricopa County Assessors web site information). Surface flow is west to slightly southwest following the general slope of the land. Because of contouring on the golf course, it appears that surface flow is somewhat funneled in the immediate area of lot #11.

In addition to establishing the surface flow pattern, Clear Creek Associates calculated the aerial extent of golf course irrigation. Figure 8 illustrates golf course irrigation areas adjacent to and upgradient of the affect lots. Including surface lakes, there is approximately 20 acres of irrigated turf upgradient of Lot #11 and an additional 4 acres upgradient of Lot #42.

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

ANALYSIS OF HOME LOTS

Based on historical and current drainage patterns, Clear Creek Associates believes that subsurface water in the vicinity of the Lots #11 and #42 results from infiltrating surface water from both excess applied golf course irrigation water and/or natural precipitation/runoff. Figure 9 illustrates two problematic areas with respect to the potential accumulation of subsurface water based on the pre- and post-development topography. Both lots #11 and #42 are located in historical drainages. Based on the depth to bedrock, it is likely that both homes have basements which are at or very near bedrock. Infiltrating water likely accumulates in the pre-development bedrock surface beneath drainages, and migrates westward eventually day lighting along the base of the SHFW. Also, water quality data from the sump water sample indicates elevated nitrate levels likely the result of fertilizers applied on the golf course. Neither City of Mesa potable water nor CAP raw water has elevated nitrate levels.

ANALYSIS OF SHFW

During Clear Creek's site visit of the SHFW on October 4, 2005, two main areas of seepage were noted along the east bank of the flood control structure. Annotated photographs of the site visit are attached. The northern seep area corresponding to an area identified by the County during their April 2005 site inspection and identified with Latitude and Longitude coordinates of 33° 29' 24' N, 111° 40' 56" W. A second smaller seep area was noted a short distance to the south at 33° 29' 21' N, 111° 40' 56" W. The largest of the two seeps is located directly along a pre-development major drainage, as illustrated on Figure 6. Clear Creek also noted an abundance of healthy vegetation along the east bank including grasses, reeds, and significant algae in the water, which suggest elevated nitrate levels. This area lies north of the Spook Hill bedrock outcrop and south of a smaller un-named bedrock outcrop. Clear Creek Associates believes that the occurrence of seepage along the east bank of the SHFW is the direct result of infiltrated surface water from excess applied golf course irrigation and/or natural precipitation/runoff from the higher elevations.

In addition to seepage along the east bank of the SHFW, Clear Creek identified small seepage areas along the west bank of the flood control structure, which are adjacent to the CAP canal. Vegetation along the west bank was less profuse and no algae were noted in the water suggesting that this sub-flow may be related to seepage from the canal rather than fertilized water from the golf course area. Additional chemical analysis of the water in the SHFW (not included in this report) would be required to evaluate nitrate levels and other inorganic chemicals in order to differentiate the two water types.

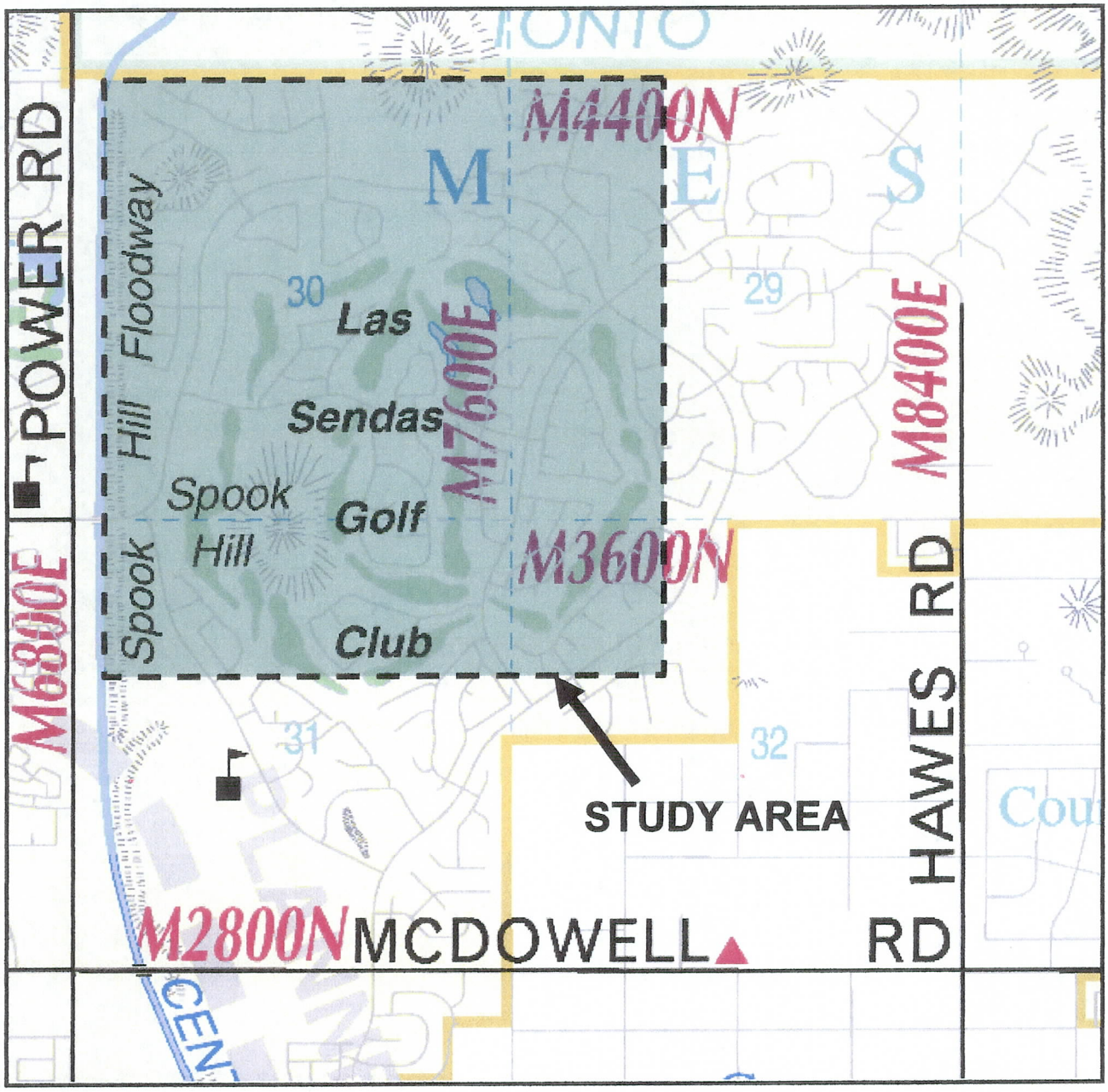
CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

SUMMARY

Based on our review of the assembled data, it is Clear Creek Associates' opinion that the source of the subsurface water occurring at Lot #11, Lot #42, and that seeping from the east bank of the SHFW is not related to the City of Mesa's water distribution system. Additional research on golf course irrigation, chemical usage, and seep water sampling would be required to specifically determine the source of the subsurface water.



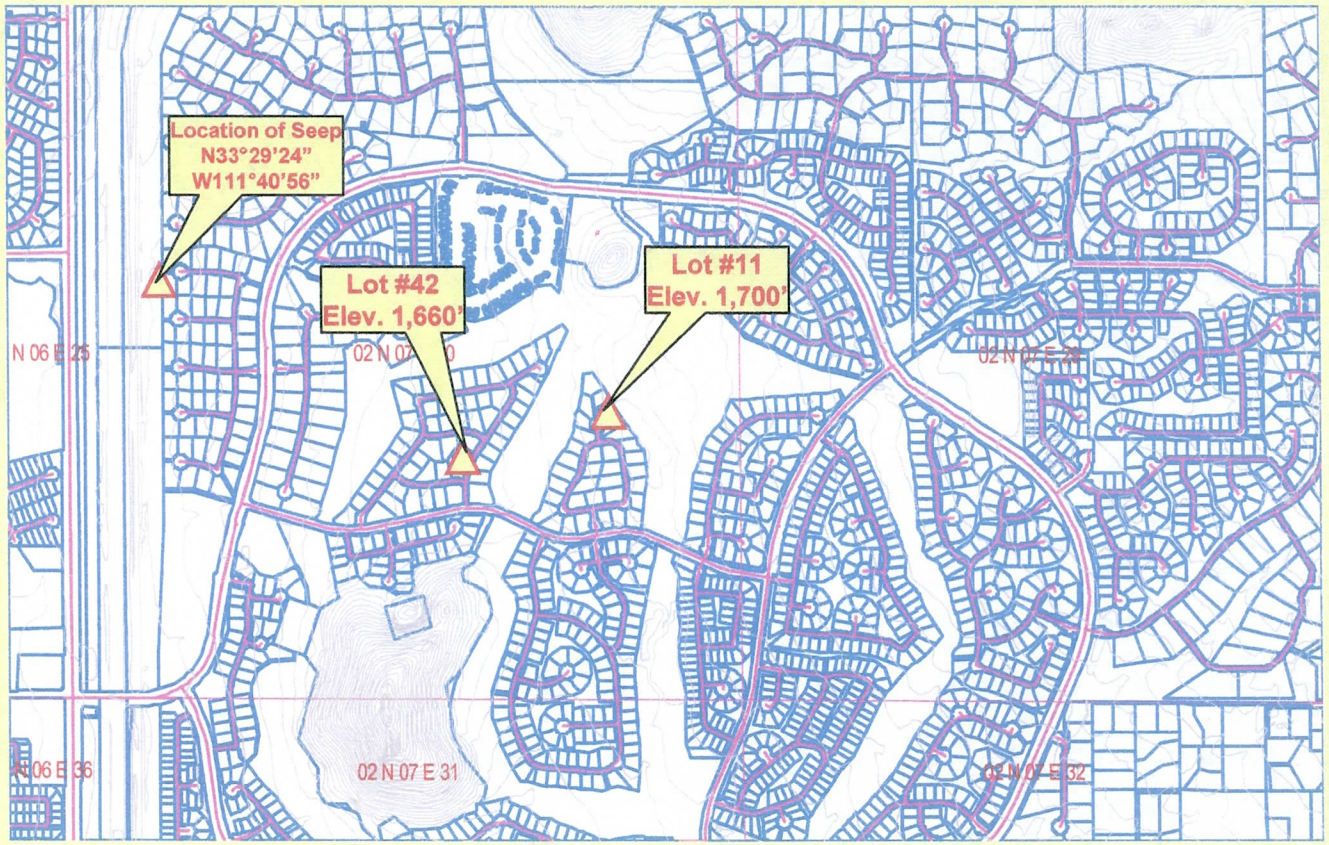
Approximate Scale in Miles

0 .5 1

N

CLEAR CREEK ASSOCIATES

FIGURE 1
VICINITY MAP
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona

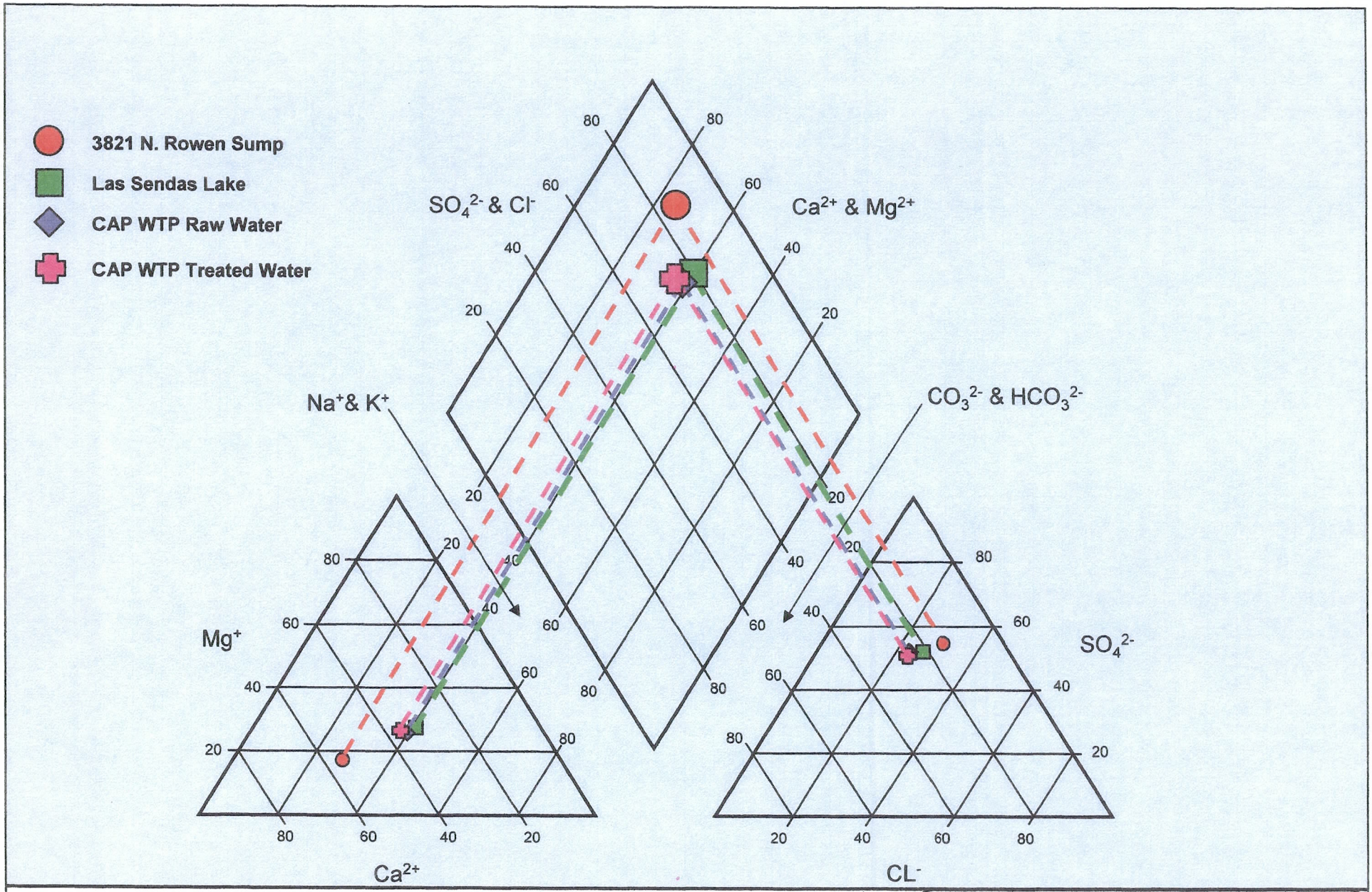


CLEAR CREEK ASSOCIATES

Current Land Surface Elevation

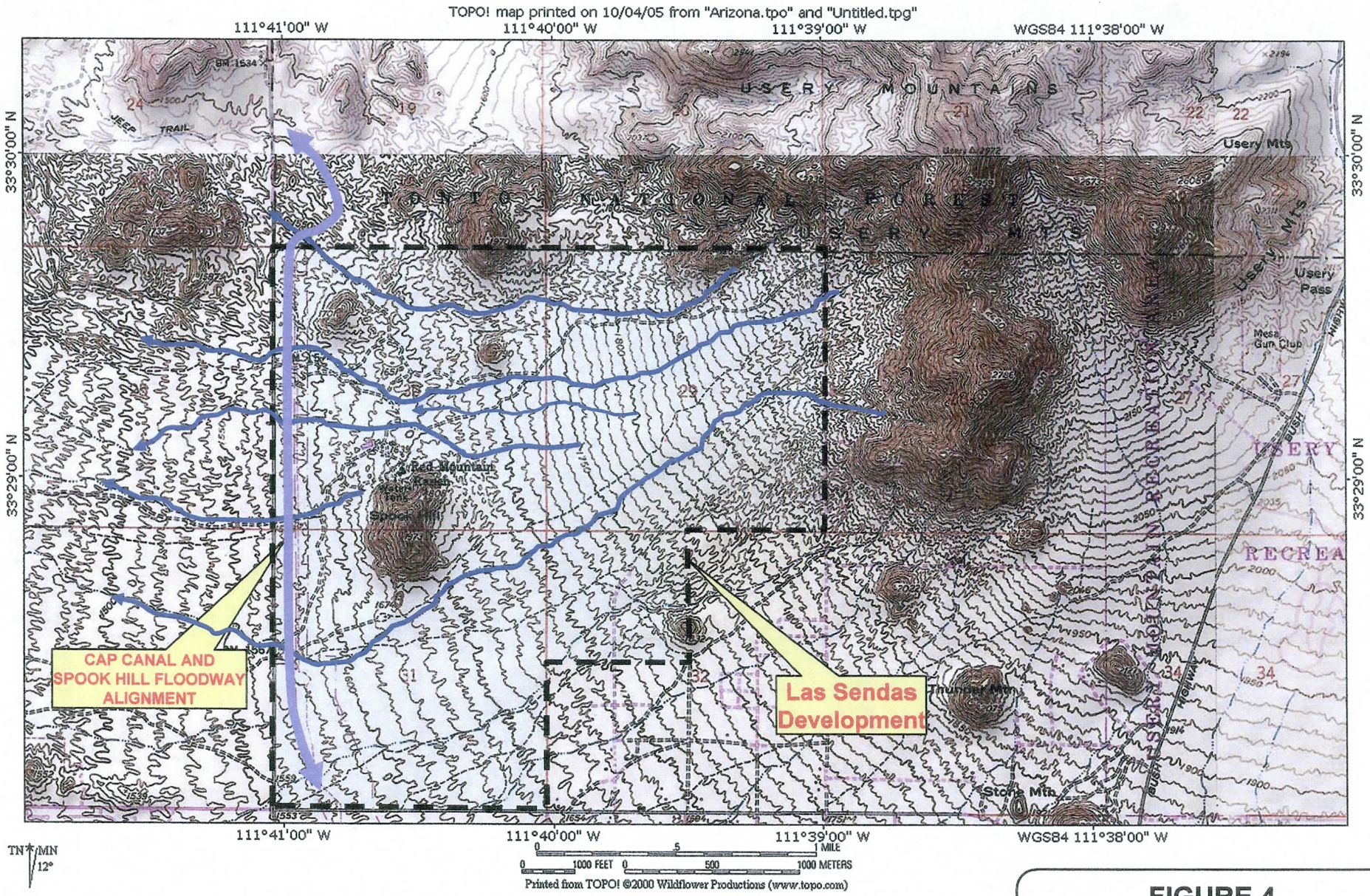
Contour Interval (10 feet)

FIGURE 2
SUBDIVISION MAP SHOWING PROBLEM SEEPAGE AREAS
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona



CLEAR CREEK ASSOCIATES

FIGURE 3
TRI-LINEAR PLOT OF WATER QUALITY
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona



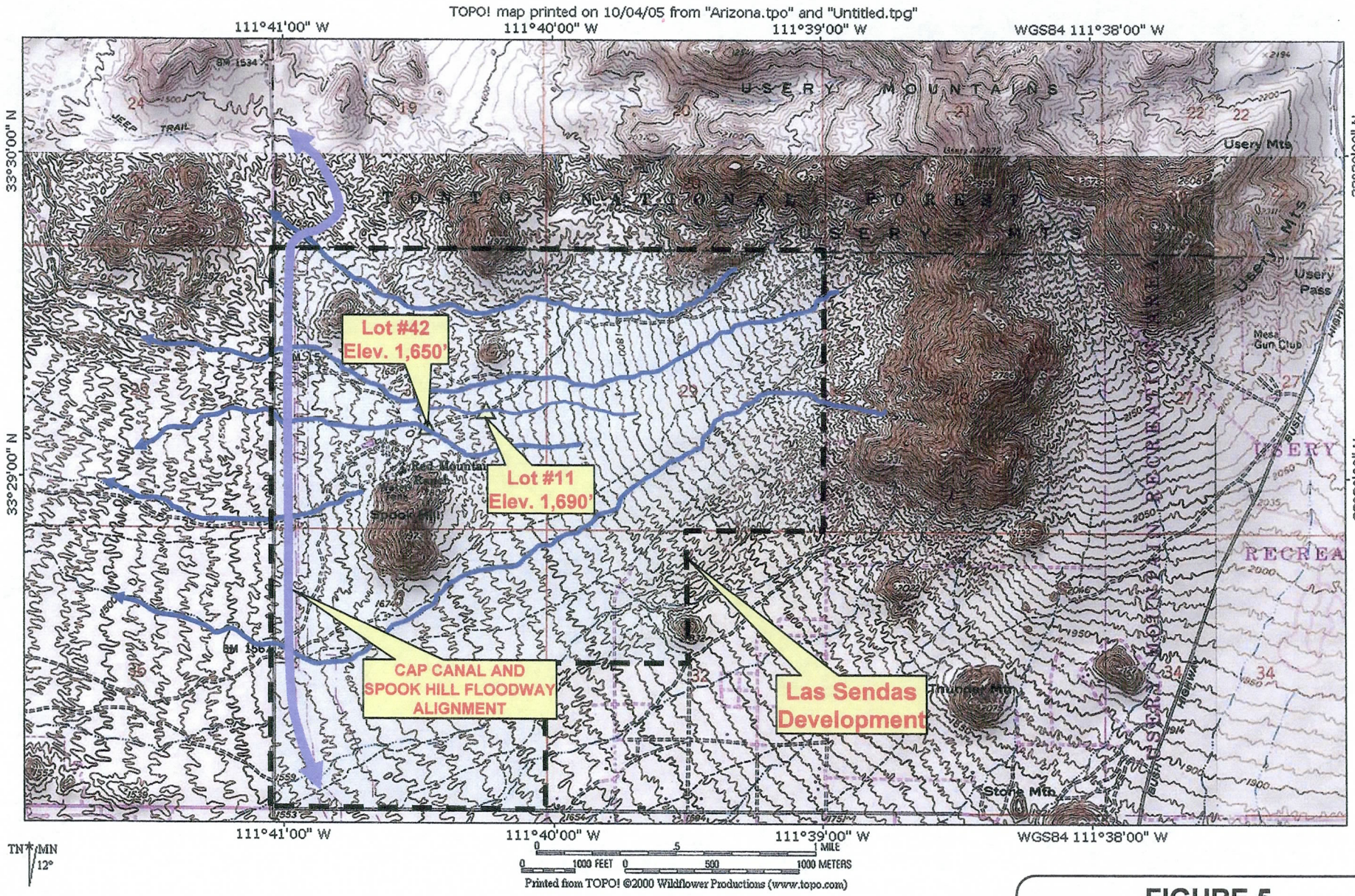
CLEAR CREEK ASSOCIATES

Historical Drainages

Major

Minor

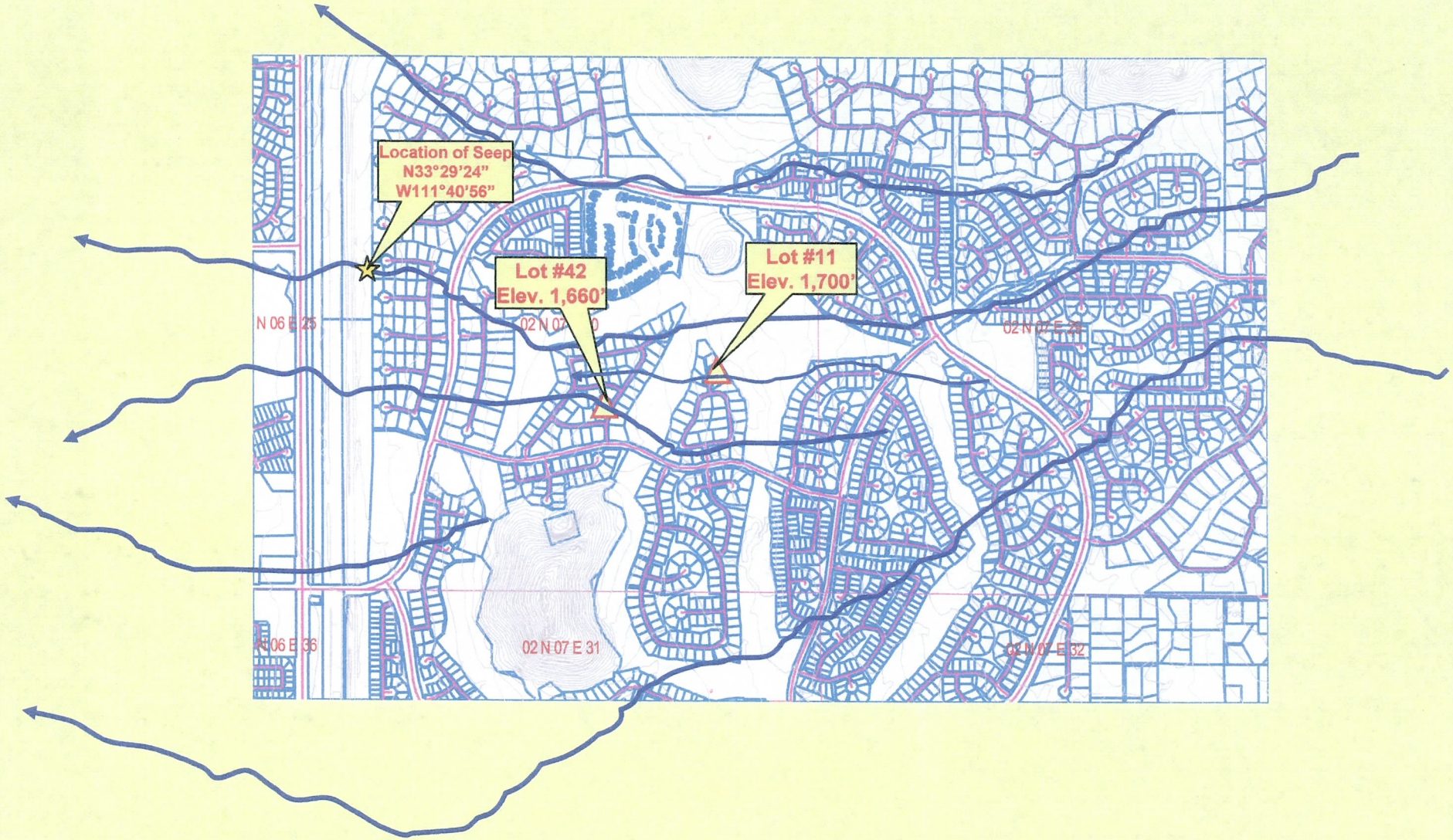
FIGURE 4
HISTORICAL DRAINAGE MAP
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona



CLEAR CREEK ASSOCIATES

Historical Drainages — **Major** / **Minor**

FIGURE 5
HISTORICAL DRAINAGE MAP
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona



Contour Interval (10 feet)

Historical Drainages — Major — Minor

CLEAR CREEK ASSOCIATES

FIGURE 6
SUBDIVISION MAP SHOWING HISTORICAL DRAINAGE PATTERNS
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona

Current Drainage

Contour Interval (10 feet)

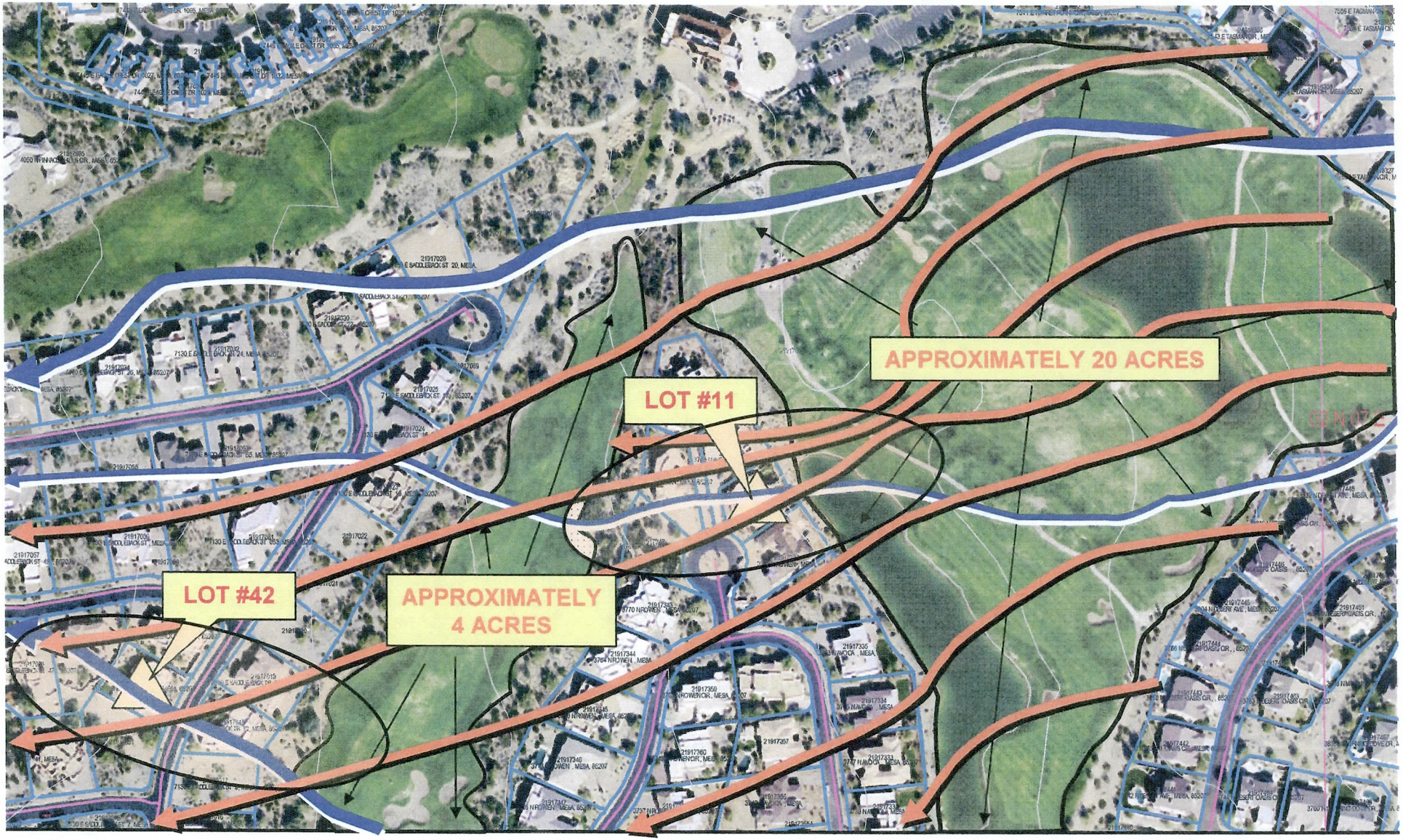
CLEAR CREEK ASSOCIATES

FIGURE 7
CURRENT DRAINAGE MAP
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona

Contour Interval (10 feet)

CLEAR CREEK ASSOCIATES

FIGURE 8
AREA OF IRRIGATED TURF AND HISTORICAL DRAINAGE
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona



Historical Drainages

Current Drainage

Potentially Impacted Area

Contour Interval (10 feet)

CLEAR CREEK ASSOCIATES

FIGURE 9
AREAS MOST SUSEPTABLE TO SUBFLOW
Las Sendas/Spook Hill
Hydrologic Seepage Study
Mesa, Arizona

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

ATTACHMENT

LEAK DETECTION REPORT

Fax Transmission From:

DETECTION SPECIALTIES INC. T.M.

Detection Specialties Inc.
331 South River Drive #13 • Tempe, Arizona 85281
480.894.6272 • 602.258.FIND • 1.800.458.FIND • FAX: 480.894.6373

from:

Vance Green
Detection Specialties Inc.
E-mail: vancegrn@primenet.com

re:

Water Leak Survey
Las Sendas

PLEASE ROUTE TO:

Alan Martindale
City of Mesa

FAX:

480.644.3899

Vance Green
Detection Specialties Inc.
331 South River Drive #13
Tempe, Arizona 85281
480.894.6272
FAX: 480.894.6373
e-mail: vancegrn@primenet.com

10 July 2002

Alan Martindale
City of Mesa
640 North Mesa Drve
Mesa, Arizona 85211
FAX: 480.644.3899

Dear Alan:

Attached please find the results of the leak detection activity at Las Sendas.

Please feel free to call me should you have any questions.

Vance Green

Vance Green

DETECTION SPECIALTIES INC. T.M.

Detection Specialties Inc.
331 South River Drive #13 • Tempe, Arizona 85281
480.894.6272 • 602.258.FIND • 1.800.458.FIND • FAX: 480.894.6373

Sonic water leak detection activity – Las Sendas housing development

9 July 2002

Sonic survey – scope:

Per instructions, the water system was checked for leak noise at adjacent accessible valves, curb stops, and other fittings in the Rowen Cir. cul-de-sac near affected lot #11, then in generally a east to northeast direction, in built-up areas directly adjacent to the portion of the golf course in this region. The entire section of the water system in Rowen Circle was pressure tested at line pressure by turning off curb stops for customers on this line section, then by turning off line valve 212-116 and noting any pressure drop via a gauge attached to the service for Lot #11.

Items checked – section map 212-D – "Las Colinas at Las Sendas"

Curb stop / water meter lot # 9, 10, 11, 12, 13, 14, 15, 16
Hydrant valve #212-48, 212-116
Line valve 212-116

Items checked – section map 212-D, "Canyon Creek at Las Sendas"

Curb stop / water meter lot # 203, 204, 205, 206, 207, 208, 209
Hydrant valve 212-62
Hydrant valve 212-63

Items checked – section map 212-C – "Pinnacle Point at Las Sendas" – infrastructure not shown on map

Hydrant and valve Lot #22/7504
Hydrant and valve Lot #33/7550
Line valve E. Tasman Circle – west cul-de-sac
Line valve E. Tasman Circle – east cul-de-sac
Hydrant and valve Lot #47/7602?
Curb stop / water meter Lot # 23, 24, 25, 26, 27, 28, 29, 30, 48, 49, 50, 51, 52, 53, 54
Hydrant and valve Lot #43/7362

Sonic water leak detection activity – Las Sendas housing development
(cont'd)

Results of sonic survey:

No audio response concurrent with the type associated with a system leak detected above background noise levels at any of the above listed items except Section map 212-C, Hydrant at lot #33/7550 and associated hydrant valve.

A leak correlation run was performed on this piping section between the hydrant and the valve. Results were inconclusive due to noise from construction activity in the area. A T-handle probe inserted approximately 5 feet into the soil next to this hydrant comes back wet. Sound pitch of the leak noise would also generally indicate that the leak is at or near the base of this hydrant.

The pressure test for the Rowen Circle segment showed no pressure loss after a 5-10 minute duration.

Recommendations:

The leak at the hydrant in the Pinnacle Point at Las Sendas should be repaired, however, it should be noted that this leak is very small, quite far away from the affected area, and is likely not contributing to the ingress of water in the basement of the house under construction on Rowen Circle.

The sump pump system removing water from the basement discharges onto the ground at grade level about 20 feet away. This water should be routed further away or into the sewer system in order to rule out the possibility that some or all of it does not return to the sump area, creating a partial "endless loop" of water simply returning to the sump to be pumped out again.

As no other domestic water system leaks were detected, it would be advisable to again check the water present in the sump for the presence of chemical additives indicating the source to be the City mains.

Since the GIS maps for the Pinnacle Point housing development (212-C and 212-D) show no water infrastructure, it is difficult to determine if other portions of the water system in this area should have been checked during the sonic survey. If the construction blueprints for this area can be found, they should be reviewed to determine if further investigation is warranted.

An attempt was made to trace the 8" DIP MD45291 main extending southwest from the clubhouse area in order to determine if it actually terminates in Lot #13, Rowen Circle as shown. It was not possible to trace this line past the curb stop and water meter just south of the bag drop. It may be that this line has previously been terminated at this point, and no longer proceeds across the golf course to Lot #13.

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

Tel 480 659 7131
Fax 480 659 7143

ATTACHMENT

WATER QUALITY ANALYSES

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Client: City of Mesa
Utility Operations
P.O. Box 1466
Mesa,AZ 85211-1466

Date Submitted: 8/17/2004
Date Reported: 8/26/2004

Attn: Mr. Alan Martindale

Sample Date: 8/17/2004
Sample Time: 8:30
Sampler: Robert Judd
Laboratory No: 0408W048

Project Name:
Project Number:
Permit Number:
Sample Location: Las Sendas Lake

RESULTS

Parameter	Method No.	PQL	Analysis Dates Start	End	Result	Unit	Analyst
Aluminum	EPA 200.8	0.001	8/18/2004	8/18/2004	0.065	mg/L	GS
Arsenic	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Antimony	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Barium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.133	mg/L	GS
Beryllium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Cadmium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Chromium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.010	mg/L	GS
Copper	EPA 200.8	0.001	8/18/2004	8/18/2004	0.009	mg/L	GS
Iron	EPA 200.8	0.100	8/18/2004	8/18/2004	0.203	mg/L	GS
Lead	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Magnesium	EPA 200.8	0.100	8/18/2004	8/18/2004	31.6	mg/L	GS
Manganese	EPA 200.8	0.001	8/18/2004	8/18/2004	0.037	mg/L	GS
Nickel	EPA 200.8	0.001	8/18/2004	8/18/2004	0.011	mg/L	GS
Selenium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Thallium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Zinc	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Calcium	EPA 200.8	0.100	8/18/2004	8/18/2004	67.7	mg/L	GS
Sodium	EPA 200.8	0.100	8/18/2004	8/18/2004	96.2	mg/L	GS
Vanadium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Fluoride	EPA 300.0	0.05	8/18/2004	8/18/2004	0.36	mg/L	JH
Chloride	EPA 300.0	0.50	8/18/2004	8/18/2004	90.0	mg/L	JH
Sulfate	EPA 300.0	2.00	8/18/2004	8/18/2004	253	mg/L	JH
Nitrate-N	EPA 300.0	0.05	8/18/2004	8/18/2004	<0.05	mg/L	JH
Nitrite-N	EPA 300.0	0.25	8/18/2004	8/18/2004	<0.05	mg/L	JH
o-Phosphate	EPA 300.0	0.05	8/18/2004	8/18/2004	<0.05	mg/L	JH
Total Alkalinity	SM2320B	1	8/19/2004	8/19/2004	120	mg/L CaCO3	MS
Bicarbonate	SM2320B	1	8/19/2004	8/19/2004	120	mg/L CaCO3	MS
Carbonate	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hydroxide	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hardness	SM2340C	1	8/19/2004	8/19/2004	306	mg/L CaCO3	MS

Reviewed By: [illegible] 8-26-04

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Laboratory No: 0408W048

QC REPORT

Parameter	Laboratory No:	Sample Result (mg/L)	Duplicate Result (mg/L)	Duplicate %RPD	Spike Amount (mg/L)	Spike Result (mg/L)	Spike % Rec	Method Blank Result	QCS Amount (mg/L)	QCS Result (mg/L)	QCS %Rec	AZ Data Qualifiers
	0408W049	0.032	0.035	8.8	0.050	0.080	96	0.004	0.050	0.050	100	B-1
Antimony	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.049	98	
Arsenic	0408W049	0.003	0.003	0	0.050	0.050	94	<0.001	0.050	0.049	98	
Barium	0408W049	0.052	0.052	0	0.050	0.108	112	<0.001	0.050	0.048	96	
Beryllium	0408W049	<0.001	<0.001	0	0.050	0.041	82	<0.001	0.050	0.052	104	
Cadmium	0408W049	<0.001	<0.001	0	0.050	0.046	92	<0.001	0.050	0.051	102	
Chromium	0408W049	0.003	0.004	28	0.050	0.050	94	0.002	0.050	0.052	104	B-1
Copper	0408W049	0.016	0.016	0	0.050	0.059	86	0.001	0.050	0.051	102	B-1
Lead	0408W049	0.001	0.001	0	0.050	0..052	104	<0.001	0.050	0.045	90	
Manganese	0408W049	0.003	0.003	0	0.050	0.051	96	<0.001	0.050	0.050	100	
Nickel	0408W049	0.002	0.002	0	0.050	0.045	86	<0.001	0.050	0.052	104	
Selenium	0408W049	0.002	0.002	0	0.050	0.044	84	<0.001	0.050	0.050	100	
Thallium	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.048	96	
Zinc	0408W049	0.008	0.008	0	0.050	0.049	82	0.001	0.050	0.051	102	B-1
Calcium	0408W049	285	278	2.5	5.00	289	80	<0.100	1.00	0.960	96	
Iron	0408W049	0.459	0.448	2.2	5.00	5.14	94	<0.100	1.00	0.953	95	
Magnesium	0408W049	59.9	59.0	1.5	5.00	64.4	108	<0.100	1.00	0.946	95	
Sodium	0408W049	164	155	5.6	5.00	158	60	<0.100	1.00	0.940	94	M-2
Fluoride	0408W049	0.65	0.66	1.5	0.50	1.19	108	<PQL	0.50	0.50	100	
Chloride	0408W049	309	310	0.3	500	797	97.6	<PQL	2.50	2.40	96.0	
Sulfate	0408W049	733	705	3.9	500	1248	1.03	<PQL	10.00	9.59	95.9	
Nitrate-N	0408W049	5.65	5.68	0.4	5.00	10.64	100	<PQL	0.50	0.49	98.0	
Nitrite-N	0408W049	<0.05	<0.05	0	0.50	0.45	90.0	<PQL	0.50	0.48	96.0	
o-Phosphate	0408W049	<0.05	<0.05	0	0.50	0.50	100	<PQL	0.50	0.50	100.0	
Total Alkalinity	0408W048	120	120	0					62.30	62.5	100.3	
Total Hardness	0408W049	914	925	1.2					132	134	101.5	

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Client: City of Mesa
Utility Operations
P.O. Box 1466
Mesa,AZ 85211-1466

Date Submitted: 8/17/2004
Date Reported: 8/26/2004

Attn: Mr. Alan Martindale

Sample Date: 8/17/2004
Sample Time: 8:55
Sampler: Robert Judd
Laboratory No: 0408W049

Project Name:
Project Number:
Permit Number:
Sample Location: 3821 N. Rowen (Sump)

RESULTS

Parameter	Method No.	PQL	Analysis Dates Start	End	Result	Unit	Analyst
Aluminum	EPA 200.8	0.001	8/18/2004	8/18/2004	0.032	mg/L	GS
Arsenic	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Antimony	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Barium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.052	mg/L	GS
Beryllium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Cadmium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Chromium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Copper	EPA 200.8	0.001	8/18/2004	8/18/2004	0.016	mg/L	GS
Iron	EPA 200.8	0.100	8/18/2004	8/18/2004	0.459	mg/L	GS
Lead	EPA 200.8	0.001	8/18/2004	8/18/2004	0.001	mg/L	GS
Magnesium	EPA 200.8	0.100	8/18/2004	8/18/2004	59.9	mg/L	GS
Manganese	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Nickel	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Selenium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Thallium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Zinc	EPA 200.8	0.001	8/18/2004	8/18/2004	0.008	mg/L	GS
Calcium	EPA 200.8	0.100	8/18/2004	8/18/2004	285	mg/L	GS
Sodium	EPA 200.8	0.100	8/18/2004	8/18/2004	164	mg/L	GS
Vanadium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.018	mg/L	GS
Fluoride	EPA 300.0	0.05	8/18/2004	8/18/2004	0.65	mg/L	JH
Chloride	EPA 300.0	0.50	8/18/2004	8/18/2004	309	mg/L	JH
Sulfate	EPA 300.0	2.00	8/18/2004	8/18/2004	733	mg/L	JH
Nitrate-N	EPA 300.0	0.05	8/18/2004	8/18/2004	5.65	mg/L	JH
Nitrite-N	EPA 300.0	0.25	8/18/2004	8/18/2004	<0.05	mg/L	JH
o-Phosphate	EPA 300.0	0.05	8/18/2004	8/18/2004	<0.05	mg/L	JH
Total Alkalinity	SM2320B	1	8/19/2004	8/19/2004	294	mg/L CaCO3	MS
Bicarbonate	SM2320B	1	8/19/2004	8/19/2004	294	mg/L CaCO3	MS
Carbonate	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hydroxide	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hardness	SM2340C	1	8/19/2004	8/19/2004	914	mg/L CaCO3	MS

Reviewed By: 8-26-04

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Laboratory No: 0408W049

QC REPORT

Parameter	Laboratory No:	Sample Result (mg/L)	Duplicate Result (mg/L)	Duplicate %RPD	Spike Amount (mg/L)	Spike Result (mg/L)	Spike % Rec	Method Blank Result	QCS Amount (mg/L)	QCS Result (mg/L)	QCS %Rec	AZ Data Qualifiers
Aluminum	0408W049	0.032	0.035	8.8	0.050	0.080	96	0.004	0.050	0.050	100	B-1
Antimony	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.049	98	
Arsenic	0408W049	0.003	0.003	0	0.050	0.050	94	<0.001	0.050	0.049	98	
Barium	0408W049	0.052	0.052	0	0.050	0.108	112	<0.001	0.050	0.048	96	
Beryllium	0408W049	<0.001	<0.001	0	0.050	0.041	82	<0.001	0.050	0.052	104	
Cadmium	0408W049	<0.001	<0.001	0	0.050	0.046	92	<0.001	0.050	0.051	102	
Chromium	0408W049	0.003	0.004	28	0.050	0.050	94	0.002	0.050	0.052	104	B-1
Copper	0408W049	0.016	0.016	0	0.050	0.059	86	0.001	0.050	0.051	102	B-1
Lead	0408W049	0.001	0.001	0	0.050	0..052	104	<0.001	0.050	0.045	90	
Manganese	0408W049	0.003	0.003	0	0.050	0.051	96	<0.001	0.050	0.050	100	
Nickel	0408W049	0.002	0.002	0	0.050	0.045	86	<0.001	0.050	0.052	104	
Selenium	0408W049	0.002	0.002	0	0.050	0.044	84	<0.001	0.050	0.050	100	
Thallium	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.048	96	
Zinc	0408W049	0.008	0.008	0	0.050	0.049	82	0.001	0.050	0.051	102	B-1
Calcium	0408W049	285	278	2.5	5.00	289	80	<0.100	1.00	0.960	96	
Iron	0408W049	0.459	0.448	2.2	5.00	5.14	94	<0.100	1.00	0.953	95	
Magnesium	0408W049	59.9	59.0	1.5	5.00	64.4	108	<0.100	1.00	0.946	95	
Sodium	0408W049	164	155	5.6	5.00	158	60	<0.100	1.00	0.940	94	M-2
Fluoride	0408W049	0.65	0.66	1.5	0.50	1.19	108	<PQL	0.50	0.50	100	
Chloride	0408W049	309	310	0.3	500	797	97.6	<PQL	2.50	2.40	96.0	
Sulfate	0408W049	733	705	3.9	500	1248	1.03	<PQL	10.00	9.59	95.9	
Nitrate-N	0408W049	5.65	5.68	0.4	5.00	10.64	100	<PQL	0.50	0.49	98.0	
Nitrite-N	0408W049	<0.05	<0.05	0	0.50	0.45	90.0	<PQL	0.50	0.48	96.0	
o-Phosphate	0408W049	<0.05	<0.05	0	0.50	0.50	100	<PQL	0.50	0.50	100.0	
Total Alkalinity	0408W048	120	120	0					62.30	62.5	100.3	
Total Hardness	0408W049	914	925	1.2					132	134	101.5	

CITY OF **MESA**
Great People, Quality Service!

Chain of Custody

LAB ID NUMBER 0408W-048
0408W-049

95 8-17-04

Lab Supervisor: Matthew Rexing
Project Manager: Jen Hetherington
P.O. Box 1466
Mesa, Arizona 85211
(480) 644-5403
(480) 644-2768 Fax
matthew_rexing@cityofmesa.org
jen_hetherington@cityofmesa.org

Sample Location: Las Sendas Community
Sample Collected By: R. Judd.
Project Name:
Project Number:
Permit Number:
pH:
Conductivity:
Temp:

Sample Receipt
No. Containers:
Custody Seals: Yes No
Rec. Cold: Yes No
temp

Comments: Temp Blk = 5°C

Sample Location	Date	Time	Matrix	Lab ID	Inorganics		Metals		Flouride						Grab/Composite	# of Containers
3821 N. Rowen Cr, Mesa	8-17-04	0855	Sump	0408W-049	✓		✓		✓							
Las Sendas Lake	8-17-04	0830	Lake	0408W-048	✓		✓		✓							

Sampled&Relinquished by:		Relinquished by:		Relinquished by:	
Signature: [signature]	Time: 0950	Signature:	Time:	Signature:	Time:
Printed Name: Robert Judd	Date: 8-17-04	Printed Name:	Date:	Printed Name:	Date:
Company Name: COM		Company Name:		Company Name:	
Received by:		**Received by:**		**Received by:**	
Signature: [signature]	Time: 0950	Signature:	Time:	Signature:	Time:
Printed Name: J.L. Smith	Date: 8-17-04	Printed Name:	Date:	Printed Name:	Date:
Company Name: C.O.M.		Company Name:		Company Name:	

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Client: City of Mesa
Utility Operations
P.O. Box 1466
Mesa,AZ 85211-1466

Date Submitted: 8/17/2004
Date Reported: 8/26/2004

Attn: Mr. Alan Martindale
Attn: Nick Silides
Sample Date: 8/17/2004
Sample Time: 9:00
Sampler: NS
Laboratory No: 0408W050

Project Name:
Project Number:
Permit Number:
Sample Location: CAP WTP Raw

RESULTS

Parameter	Method No.	PQL	Analysis Dates Start	End	Result	Unit	Analyst
Aluminum	EPA 200.8	0.001	8/18/2004	8/18/2004	0.057	mg/L	GS
Arsenic	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Antimony	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Barium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.133	mg/L	GS
Beryllium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Cadmium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Chromium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.005	mg/L	GS
Copper	EPA 200.8	0.001	8/18/2004	8/18/2004	0.007	mg/L	GS
Iron	EPA 200.8	0.100	8/18/2004	8/18/2004	0.153	mg/L	GS
Lead	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Magnesium	EPA 200.8	0.100	8/18/2004	8/18/2004	30.4	mg/L	GS
Manganese	EPA 200.8	0.001	8/18/2004	8/18/2004	0.010	mg/L	GS
Nickel	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Selenium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Thallium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Zinc	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Calcium	EPA 200.8	0.100	8/18/2004	8/18/2004	72.5	mg/L	GS
Sodium	EPA 200.8	0.100	8/18/2004	8/18/2004	91.7	mg/L	GS
Vanadium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Fluoride	EPA 300.0	0.05	8/18/2004	8/18/2004	0.35	mg/L	JH
Chloride	EPA 300.0	0.50	8/18/2004	8/18/2004	84.4	mg/L	JH
Sulfate	EPA 300.0	2.00	8/18/2004	8/18/2004	241	mg/L	JH
Nitrate-N	EPA 300.0	0.05	8/18/2004	8/18/2004	0.18	mg/L	JH
Nitrite-N	EPA 300.0	0.25	8/18/2004	8/18/2004	<0.05	mg/L	JH
o-Phosphate	EPA 300.0	0.05	8/18/2004	8/18/2004	<0.05	mg/L	JH
Total Alkalinity	SM2320B	1	8/19/2004	8/19/2004	145	mg/L CaCO3	MS
Bicarbonate	SM2320B	1	8/19/2004	8/19/2004	145	mg/L CaCO3	MS
Carbonate	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hydroxide	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hardness	SM2340C	1	8/19/2004	8/19/2004	312	mg/L CaCO3	MS

Reviewed By: 8-26-04

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Laboratory No: 0408W050

QC REPORT

Parameter	Laboratory No:	Sample Result (mg/L)	Duplicate Result (mg/L)	Duplicate %RPD	Spike Amount (mg/L)	Spike Result (mg/L)	Spike % Rec	Method Blank Result	QCS Amount (mg/L)	QCS Result (mg/L)	QCS %Rec	AZ Data Qualifiers
Aluminum	0408W049	0.032	0.035	8.8	0.050	0.080	96	0.004	0.050	0.050	100	B-1
Antimony	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.049	98	
Arsenic	0408W049	0.003	0.003	0	0.050	0.050	94	<0.001	0.050	0.049	98	
Barium	0408W049	0.052	0.052	0	0.050	0.108	112	<0.001	0.050	0.048	96	
Beryllium	0408W049	<0.001	<0.001	0	0.050	0.041	82	<0.001	0.050	0.052	104	
Cadmium	0408W049	<0.001	<0.001	0	0.050	0.046	92	<0.001	0.050	0.051	102	
Chromium	0408W049	0.003	0.004	28	0.050	0.050	94	0.002	0.050	0.052	104	B-1
Copper	0408W049	0.016	0.016	0	0.050	0.059	86	0.001	0.050	0.051	102	B-1
Lead	0408W049	0.001	0.001	0	0.050	0..052	104	<0.001	0.050	0.045	90	
Manganese	0408W049	0.003	0.003	0	0.050	0.051	96	<0.001	0.050	0.050	100	
Nickel	0408W049	0.002	0.002	0	0.050	0.045	86	<0.001	0.050	0.052	104	
Selenium	0408W049	0.002	0.002	0	0.050	0.044	84	<0.001	0.050	0.050	100	
Thallium	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.048	96	
Zinc	0408W049	0.008	0.008	0	0.050	0.049	82	0.001	0.050	0.051	102	B-1
Calcium	0408W049	285	278	2.5	5.00	289	80	<0.100	1.00	0.960	96	
Iron	0408W049	0.459	0.448	2.2	5.00	5.14	94	<0.100	1.00	0.953	95	
Magnesium	0408W049	59.9	59.0	1.5	5.00	64.4	108	<0.100	1.00	0.946	95	
Sodium	0408W049	164	155	5.6	5.00	158	60	<0.100	1.00	0.940	94	M-2
Fluoride	0408W049	0.65	0.66	1.5	0.50	1.19	108	<PQL	0.50	0.50	100	
Chloride	0408W049	309	310	0.3	500	797	97.6	<PQL	2.50	2.40	96.0	
Sulfate	0408W049	733	705	3.9	500	1248	1.03	<PQL	10.00	9.59	95.9	
Nitrate-N	0408W049	5.65	5.68	0.4	5.00	10.64	100	<PQL	0.50	0.49	98.0	
Nitrite-N	0408W049	<0.05	<0.05	0	0.50	0.45	90.0	<PQL	0.50	0.48	96.0	
o-Phosphate	0408W049	<0.05	<0.05	0	0.50	0.50	100	<PQL	0.50	0.50	100.0	
Total Alkalinity	0408W048	120	120	0					62.30	62.5	100.3	
Total Hardness	0408W049	914	925	1.2					132	134	101.5	

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Client: City of Mesa
Utility Operations
P.O. Box 1466
Mesa,AZ 85211-1466

Date Submitted: 8/17/2004
Date Reported: 8/26/2004

Attn: Mr. Alan Martindale
Attn: Nick Silides
Sample Date: 8/17/2004
Sample Time: 9:20
Sampler: NS
Laboratory No: 0408W052

Project Name:
Project Number:
Permit Number:
Sample Location: CAP WTP Res Eff

RESULTS

Parameter	Method No.	PQL	Analysis Dates Start	End	Result	Unit	Analyst
Aluminum	EPA 200.8	0.001	8/18/2004	8/18/2004	0.169	mg/L	GS
Arsenic	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Antimony	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Barium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.127	mg/L	GS
Beryllium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Cadmium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Chromium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Copper	EPA 200.8	0.001	8/18/2004	8/18/2004	0.005	mg/L	GS
Iron	EPA 200.8	0.100	8/18/2004	8/18/2004	0.092	mg/L	GS
Lead	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Magnesium	EPA 200.8	0.100	8/18/2004	8/18/2004	28.7	mg/L	GS
Manganese	EPA 200.8	0.001	8/18/2004	8/18/2004	0.001	mg/L	GS
Nickel	EPA 200.8	0.001	8/18/2004	8/18/2004	0.001	mg/L	GS
Selenium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.002	mg/L	GS
Thallium	EPA 200.8	0.001	8/18/2004	8/18/2004	<0.001	mg/L	GS
Zinc	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Calcium	EPA 200.8	0.100	8/18/2004	8/18/2004	70.0	mg/L	GS
Sodium	EPA 200.8	0.100	8/18/2004	8/18/2004	83.4	mg/L	GS
Vanadium	EPA 200.8	0.001	8/18/2004	8/18/2004	0.003	mg/L	GS
Fluoride	EPA 300.0	0.05	8/18/2004	8/18/2004	0.75	mg/L	JH
Chloride	EPA 300.0	0.50	8/18/2004	8/18/2004	87.3	mg/L	JH
Sulfate	EPA 300.0	2.00	8/18/2004	8/18/2004	244	mg/L	JH
Nitrate-N	EPA 300.0	0.05	8/18/2004	8/18/2004	0.16	mg/L	JH
Nitrite-N	EPA 300.0	0.25	8/18/2004	8/18/2004	<0.05	mg/L	JH
o-Phosphate	EPA 300.0	0.05	8/18/2004	8/18/2004	<0.05	mg/L	JH
Total Alkalinity	SM2320B	1	8/19/2004	8/19/2004	136	mg/L CaCO3	MS
Bicarbonate	SM2320B	1	8/19/2004	8/19/2004	136	mg/L CaCO3	MS
Carbonate	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hydroxide	SM2320B	1	8/19/2004	8/19/2004	<1	mg/L CaCO3	MS
Hardness	SM2340C	1	8/19/2004	8/19/2004	320	mg/L CaCO3	MS

Reviewed By: 8-26-04

CITY OF MESA
COMPLIANCE LABORATORY
640 North Mesa Drive Mesa, Arizona 85211
Ph (480)644-5403 Fax (480) 644-2768
Environmental Laboratory License AZ0410

Laboratory No: 0408W052

QC REPORT

Parameter	Laboratory No:	Sample Result (mg/L)	Duplicate Result (mg/L)	Duplicate %RPD	Spike Amount (mg/L)	Spike Result (mg/L)	Spike % Rec	Method Blank Result	QCS Amount (mg/L)	QCS Result (mg/L)	QCS %Rec	AZ Data Qualifiers
Aluminum	0408W049	0.032	0.035	8.8	0.050	0.080	96	0.004	0.050	0.050	100	B-1
Antimony	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.049	98	
Arsenic	0408W049	0.003	0.003	0	0.050	0.050	94	<0.001	0.050	0.049	98	
Barium	0408W049	0.052	0.052	0	0.050	0.108	112	<0.001	0.050	0.048	96	
Beryllium	0408W049	<0.001	<0.001	0	0.050	0.041	82	<0.001	0.050	0.052	104	
Cadmium	0408W049	<0.001	<0.001	0	0.050	0.046	92	<0.001	0.050	0.051	102	
Chromium	0408W049	0.003	0.004	28	0.050	0.050	94	0.002	0.050	0.052	104	B-1
Copper	0408W049	0.016	0.016	0	0.050	0.059	86	0.001	0.050	0.051	102	B-1
Lead	0408W049	0.001	0.001	0	0.050	0..052	104	<0.001	0.050	0.045	90	
Manganese	0408W049	0.003	0.003	0	0.050	0.051	96	<0.001	0.050	0.050	100	
Nickel	0408W049	0.002	0.002	0	0.050	0.045	86	<0.001	0.050	0.052	104	
Selenium	0408W049	0.002	0.002	0	0.050	0.044	84	<0.001	0.050	0.050	100	
Thallium	0408W049	<0.001	<0.001	0	0.050	0.053	106	<0.001	0.050	0.048	96	
Zinc	0408W049	0.008	0.008	0	0.050	0.049	82	0.001	0.050	0.051	102	B-1
Calcium	0408W049	285	278	2.5	5.00	289	80	<0.100	1.00	0.960	96	
Iron	0408W049	0.459	0.448	2.2	5.00	5.14	94	<0.100	1.00	0.953	95	
Magnesium	0408W049	59.9	59.0	1.5	5.00	64.4	108	<0.100	1.00	0.946	95	
Sodium	0408W049	164	155	5.6	5.00	158	60	<0.100	1.00	0.940	94	M-2
Fluoride	0408W049	0.65	0.66	1.5	0.50	1.19	108	<PQL	0.50	0.50	100	
Chloride	0408W049	309	310	0.3	500	797	97.6	<PQL	2.50	2.40	96.0	
Sulfate	0408W049	733	705	3.9	500	1248	1.03	<PQL	10.00	9.59	95.9	
Nitrate-N	0408W049	5.65	5.68	0.4	5.00	10.64	100	<PQL	0.50	0.49	98.0	
Nitrite-N	0408W049	<0.05	<0.05	0	0.50	0.45	90.0	<PQL	0.50	0.48	96.0	
o-Phosphate	0408W049	<0.05	<0.05	0	0.50	0.50	100	<PQL	0.50	0.50	100.0	
Total Alkalinity	0408W048	120	120	0					62.30	62.5	100.3	
Total Hardness	0408W049	914	925	1.2					132	134	101.5	

CITY OF **MESA**
Great People, Quality Service!

Chain of Custody

LAB ID NUMBER

.ab Supervisor: Matthew Rexing
'roject Manager: Jen Hetherington
'.O. Box 1466
/lesa, Arizona 85211
480) 644-5403
480) 644-2768 Fax
matthew_rexing@cityofmesa.org
en_hetherington@cityofmesa.org

Sample Location: CAPWTP
Sample Collected By: Nick Silider
Project Name: Monthly
Project Number:
Permit Number:
pH:
Conductivity:
Temp:

Sample Receipt
No. Containers:
Custody Seals: Yes No
Rec. Cold: Yes No

Comments:

Sample Location	Date	Time	Matrix	Lab ID	E. Coli	Anions	TOC	Metals							Grab/Composite	# of Containers
CAPWTP RAW	8-17-04	0900	SW	0408W-050	X	X	X	X							G	5
R.I #1	↓	0915	DW	↓ -051			X								G	2
Res. Eff.		0920	DW	↓ -052		X		X							G	2

Sampled&Relinquished by:
Signature: [signature] Time: 1040
Printed Name: Nicholas Silider Date: 8-17-04
Company Name: C.O. Mesa

Relinquished by:
Signature: Time:
Printed Name: Date:
Company Name:

Relinquished by:
Signature: Time:
Printed Name: Date:
Company Name:

Received by:
Signature: [signature] Time: 1040
Printed Name: G.L. Smith Date: 8-17-04
Company Name: C.O.M. Compliance

Received by:
Signature: Time:
Printed Name: Date:
Company Name:

Received by:
Signature: Time:
Printed Name: Date:
Company Name:

CLEAR CREEK ASSOCIATES

6155 East Indian School Rd, Suite 200
Scottsdale, Arizona 85251

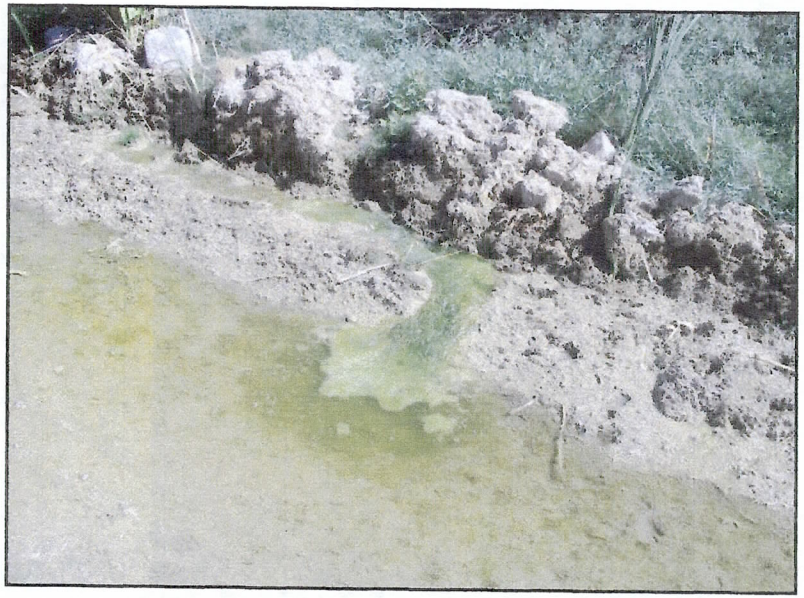
Tel 480 659 7131
Fax 480 659 7143

ATTACHMENT

PHOTOGRAPHS

Seepage water along west side of SHFW possibly due to CAP leakage.

Possible CAP seepage with moderate plant health and no algal growth.



Nitrate laden seepage with exceptional plant health and significant algae.

Another area of nitrate seepage along east bank of SHFW.

Normal vegetation along east bank of SHFW without supplemental seepage water.

Vegetation supported with long-term seepage water.

Close up of seepage along east bank of SHFW.

Major seepage area near former bedrock drainage.