BSEACD
Barton Springs/ Edwards Aquifer Conservation District

In cooperation with the City of Austin

Summary of 2005 Groundwater Dye Tracing, Barton Springs Segment of the Edwards Aquifer, Hays and Travis Counties, Central Texas

BSEACD Report of Investigations 2006-0530

Barton Springs/Edwards Aquifer Conservation District
1124 Regal Row
Austin, Texas

John Dupnik (BSEACD) dives for dye receptors at San Marcos Springs (Diversion orifice). The metal diversion pipe was temporarily removed allowing a view of the large spring orifice. Photograph taken by Brian A. Smith, May 2005.

Cover. Scott Hiers (COA) pours 20 lbs of fluorescein dye into Spillar Sinkhole. The dye was detected at Barton Springs, located 11.5 miles from the injection site, in 3.2 days. Photograph taken by Brian B. Hunt.

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by Brian B. Hunt, P.G.; Brian A. Smith, Ph.D., P.G.; and Joseph Beery
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and

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ABSTRACT

The Barton Springs/Edwards Aquifer Conservation District and the City of Austin, injected non-toxic organic dyes into four karst features within the western portion of the Barton Springs segment of the Edwards Aquifer in May 2005. The objectives of the study were to determine time-of-travel, direction, and destination of groundwater flow, and to better delineate the groundwater divide between the Barton Springs and San Antonio segments of the Edwards Aquifer south of Onion Creek. The study was conducted during relatively high-flow conditions while Barton Springs discharged at 104 cfs. Rapid groundwater flow rates from creek and upland recharge features to Barton Springs were documented and ranged from 2.3 to 7.4 miles per day. This study revealed a hydraulic connection between Cripple Crawfish Cave in Onion Creek and San Marcos Springs under the study conditions. Cripple Crawfish Cave was injected with dye that was detected at wells and both Barton and San Marcos Springs, although the concentrations at San Marcos were small compared to Barton Springs. A previous injection of Cripple Crawfish Cave in 2002, under different hydrologic conditions, was not detected at San Marcos Springs. These results indicate that the groundwater divide separating the Barton Springs and San Antonio segments may fluctuate according to hydrologic (and hydraulic head) conditions. Groundwater flow routes were documented in the eastern and confined portion of the Barton Springs segment of the Edwards Aquifer and further support a flow route along the eastern boundary of the aquifer.

INTRODUCTION

The Barton Springs/Edwards Aquifer Conservation District (BSEACD) and the City of Austin (COA) injected non-toxic organic dyes into four karst features within the western portion of the Barton Springs aquifer in May 2005 (**Figure 1**). The objectives of this groundwater tracing study were to determine the time-of-travel, direction, and destination of groundwater flow, and to better delineate the groundwater divide between the Barton Springs and San Antonio segments of the Edwards Aquifer south of Onion Creek. Cripple Crawfish Cave was previously traced in 2002 (Hunt et al., 2005), and was injected again to refine those results. This report presents a summary of findings from the investigation.

Aquifer Conditions

Aquifer conditions in the Edwards Aquifer were relatively high during the study, with creeks flowing across a portion of the recharge zone and contributing recharge to the aquifer. Barton Springs discharge was 104 cubic feet per second (cfs), well above its 69 cfs average for the month of May over the period of record. San Marcos Springs discharge was 277 cfs, well above its 172 cfs average for the month of May over the period of record (**Figure 2**).

Despite the overall high aquifer conditions in May 2005, these conditions were relatively lower when compared to the conditions during a dye trace conducted in August 2002 (Hunt et al., 2005). San Marcos Springs, Onion Creek, and the Blanco River discharged at relatively lower rates in 2005 than 2002 (**Figure 2**). Springflow at Barton Springs was the same in August 2002 and May 2005, although Onion Creek was flowing 47 cfs lower in 2005 than 2002, and Cripple Crawfish Cave was observed to be recharging less in 2005 than 2002 (Joe Beery, Personal communication). Antioch Cave, the largest known recharge feature in the Barton Springs segment and located 5.5 miles downstream of Cripple Crawfish Cave on Onion Creek, was not recharging water at the time of the 2005 injection. However, Antioch Cave was recharging water during the 2002 trace.

METHODS

Groundwater dye tracing involves the introduction of non-toxic, organic dyes into the subsurface via injection points, such as caves, sinkholes, and wells, and analyzing charcoal receptors and water samples taken from discharge points such as wells and springs. Alexander and Quinlan (1992) and Alley (1999) discuss the methodology of groundwater tracing with dyes.

Four traditional, well-documented, and distinct organic dyes were injected into the four natural recharge features in this study and are listed in **Table 1**. Eosine was injected into Cripple Crawfish Cave using water that was naturally flowing in Onion Creek and that was recharging the aquifer through that feature. All other dyes were flushed into the remaining karst features using water provided by a tanker truck (**Table 1**).

Sample Collection

Spring sampling locations include Barton Springs (Main, Eliza, Upper, and Old Mill spring outlets) and San Marcos Springs (Crater Bottom, Weismueller, Diversion, and Deep Hole spring outlets) and the spillway of the dam forming Spring Lake in San Marcos (**Figure 3**).

Figure 1: Mark Saunders (COA) injecting eosine dye into a PVC pipe inserted into Cripple Crawfish Cave on Onion Creek.

Barton Springs sites were monitored between 4/28/05 to 5/3/05 with charcoal receptors before dye injection to detect background presence of dyes. Upper Barton Springs had a consistent background of eosine fluorescence and therefore was not sampled again after the dyes were injected. Receptors and grab samples from springs were analyzed at the Ozark Underground Laboratory (OUL) in Missouri. Sampling supplies were provided by OUL, and sampling procedures outlined by OUL were followed (Aley, 1999). After injection of the dye, charcoal receptors were collected daily beginning 5/6/05 until 5/17/05, and then every few days thereafter at Barton Springs until 6/2/05 with a final set of receptors collected on 6/16/05. Grab samples were taken when receptors were changed. In addition, water samples were taken from an ISCO 3700 Automatic Compact Sampler at 4-hour intervals at Barton Springs (Main, Old Mill, Eliza) from 5/4/05 to 6/4/05.

San Marcos Spring sites were monitored between 4/28/05 to 5/4/05 with charcoal receptors before the dye injection in order to detect background presence of dyes. No background fluorescence was detected. Receptors and grab samples were collected at San Marcos Springs every 3 to 4 weeks starting 5/4/05 until 8/1/05.

During this study, 83 wells were monitored for the presence or absence of dyes in groundwater (**Table 2**). Duration of monitoring varies for many of the wells, although generally receptors were collected about every 4 weeks starting 4/18/05 until 8/2/05. Two well locations were discontinued after initial sampling (58-50-5DD and 58-50-861) due to chlorination in the water system and intermittent access, respectively.

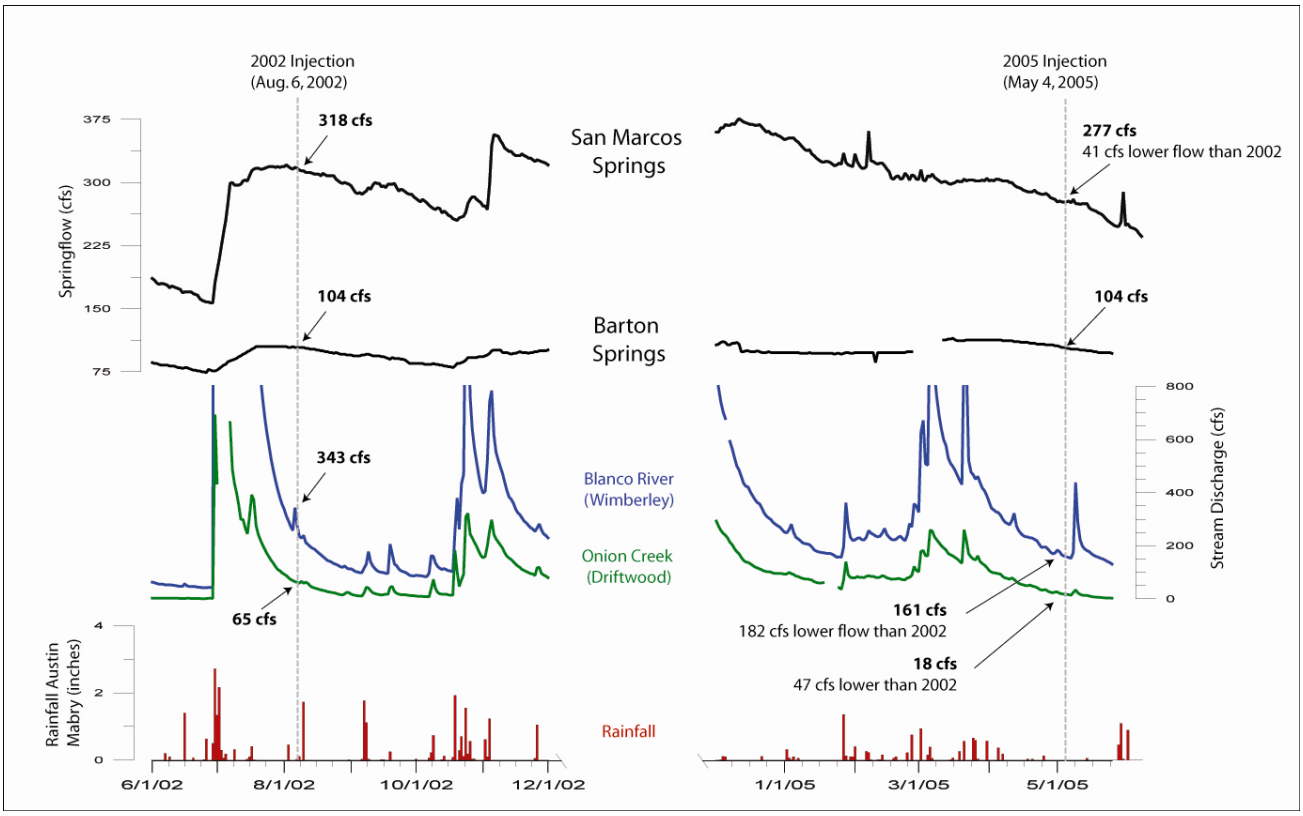

Figure 2: Springflow and surface stream hydrographs during the 2002 and 2005 dye traces.

RESULTS

Results of the dye trace are summarized in **Table 1** and a list of monitored wells is provided in **Table 2**. Positive dye recoveries from wells are presented in **Table 3** and interpreted flow paths are presented in **Figure 3**. Breakthrough curves for Barton Springs are presented in **Figures 4a-c**. A list of receptor results is presented for San Marcos Springs in **Table 4**. The **Appendix** contains the results of water and charcoal samples taken from Barton Springs.

Quality Control

Each dye receptor was handled following standard chain-of-custody protocols. Control samples, consisting of charcoal packets handled by field personnel during the course of sampling, were analyzed. These samples were tested for cross contamination between sites or contamination from other materials to which field personnel might have been exposed. No false positives were detected for control samples. No false positives were reported for OUL laboratory control samples and blanks.

However, false positives were detected at two well sites. Those sites include RWT at well site 58-57-5JB (Jack Bauer) and fluorescein at well site 58-50-301 (Lovelady). Potential sources of contamination include fluorescent paintballs noted to have been shot at the Lovelady well-head in 2004 (Brian Hunt, personal communication), and cross contamination from field personnel that observed the RWT injection and then proceeded to collect receptor 58-57-5JB (Joe Beery, personal communication).

Many charcoal receptors from wells, especially in the Ruby Ranch area, were noted to be dry when collected (**Table 2**). Dry receptors could indicate that groundwater was not passing through the receptor, which could lead to a "false negative" result.

First arrival of dye from Cripple Crawfish Cave to Main Barton Springs is calculated to have occurred at the first positive sample at 5/7/05 12:00 AM for a travel time of about 2.4 days. Non-detection on a charcoal receptor constrains the first arrival to have occurred after 5/6/05 8:20 AM; this time is likely very close to the real first arrival since a water sample from Old Mill Spring was non-detect on 5/7/05 12:41 AM.

Concurrent Dye Tracing Activities

In addition to the injections conducted by the BSEACD and the COA, the Edwards Aquifer Authority (EAA) injected 5.5 lbs of fluorescein at Ezell's Cave located south of San Marcos Springs on 7/5/2005 (Steve Johnson, personal communication). Fluorescein dye was detected on District charcoal receptors that were placed at San Marcos Springs between 6/15/05 and 8/1/05 (**Table 4**), and is attributed to that injection. Notably the receptors placed in the northern-most spring named Crater Bottom (**Figure 3**) did not detect fluorescein.

An additional trace by the EAA and UT-Austin occurred on May 23, 2005 in the contributing zone watershed of the San Antonio segment of the Edwards Aquifer. This trace was a demonstration injection into 2 recharge features near Jacob's Well (Steve Johnson, personal communication). Jacob's Well is a spring within the Glen Rose Formation that discharges into Cypress Creek (a tributary of the Blanco River) near the town of Wimberley, in western Hays County. Jacob's well is about 15.5 miles northwest of San Marcos Springs. Injection 1 was 0.29 lbs (130 grams) of phloxene B dye into a sinkhole 430 meters from Jacob's well. Injection 2 was 0.44 lbs of eosine dye into a sinkhole about 1,000 meters from Jacob's well (Brad Wolaver, personal communication). The potential for the EAA (eosine) dye arriving at San Marcos Springs is not considered plausible given the aquifer setting (Glen Rose), distance, and 24-hour time interval between EAA dye injection and positive recovery of eosine at San Marcos Springs.

Table 1: Summary of results.

Injection Site	Dye Type	Watershed	Injection Date/Time	Dye Mass (lbs)	Injection Comments	First Arrival Time at Barton Springs (days)	First Arrival Time at San Marcos Springs (days)	No. Wells Detected Dye	Straight-line Distance to Barton Springs (miles)	Minimum Groundwater Flow rate to Barton Springs (mi/day)	% Dye Mass Recovery at Barton Springs
Cripple Crawfish Cave	Eosine	Onion Creek	5/4/05 15:00	35	Flushed with creek flow	2.38	20 max	14	17.5	7.4	5.2
Hoskins Hole Cave	SRB	Onion Creek	5/4/05 12:00	35	Flushed with 2700 gallons; 5000 gallons 5/11	ND	ND	ND	17.0	ND	ND
Spillar Sinkhole	Fluorescein	Bear Creek	5/5/05 13:15	20	Flushed with 3,500 gallons	3.28	ND	0	11.5	3.5	10.1
HQ Flat Sinkhole	RWT	Slaughter	5/5/05 9:00	20	Flushed with 3,500 gallons	4.13	ND	1	9.5	2.3	41.7

Table 2: List of wells monitored.

Well ID Number	Well Name
58-42-927	School for the Deaf
58-49-9DB	Dan Bown
58-49-9DT	Denise Thomlinson*
58-49-9JO	Pam Wilson*
58-49-9KM	Jennifer Molenar*
58-49-9MV	Mike Vivian
58-49-9RK	Randy Kohles
58-49-9TS	Terry Strickland
58-50-215	Sunset Valley
58-50-301	Lovelady
58-50-3AS	Barton Hills - Broken Spoke
58-50-417	Zumwald*
58-50-4BT	Bill Burnet*
58-50-4GS	Bowie USGS
58-50-4HR	Harris Ranch*
58-50-4MK	Shelley
58-50-511	Johnson
58-50-520	Mendieta*
58-50-5TH	Tom Hendreck
58-50-743	Shady Hollow PWS
58-50-7BG	Barton Galle
58-50-7DF	Denam
58-50-7DT	David Tidwell
58-50-7GS	Edwards Crossing - USGS
58-50-7LP	Polo
58-50-7RD	Reverend Davis
58-50-833	Dowell Ranch
58-50-836	Onion Creek Country Club
58-50-860	Texanna Nursery
58-57-204	Ruby residence - bottom well*
58-57-2GS	Rudy Ranch - USGS
58-57-2JR	Ruby residence - north well*
58-57-2R2	Ruby residence - middle well*
58-57-2RR	400 Ruby Ranch
58-57-308	Huntington Estates*
58-57-313	Clinton
58-57-314	Elliot Ranch
58-57-3BB	Corner of Jerry Lane*
58-57-3BF	Freitag
58-57-3CS	Sterlings*
58-57-3CX	315 Ruby Ranch*
58-57-3EG	Butch Garza

Table 2: List of wells monitored.

Well ID Number	Well Name
58-57-3ES	Eric Swanson
58-57-3JP	John and Patricia Hords*
58-57-3JY	Robinson
58-57-3KF	Kalie Kate*
58-57-3KK	310 Ruby Ranch*
58-57-3NB	Oak Forrest Cove*
58-57-3RF	Bobboy Frietz*
58-57-3RM	Raul Martinez
58-57-507	Sky Ranch
58-57-509	Onion Creek Lodge
58-57-5CY	Cross-house package*
58-57-5J2	Inn above Onion*
58-57-5JB	Jack Bauer*
58-57-5T4	Ruby Ranch PWS #4
58-57-606	Cindy Barton
58-57-608	Ruby Ranch PWS #1
58-57-610	Ray Holt
58-57-6BP	Kathy, next door to Ray Holt
58-57-6KM	409 Matzig*
58-57-6KW	410 Matzig
58-57-6MZ	401 Matzig*
58-57-6SI	400 Matzig
58-57-903	Negley
58-57-9N1	Kyle PWS, north*
58-58-121	Liesurewoods
58-58-220	Hunter
58-58-2TS	Terry
58-58-403	Buda #2
58-58-406	Texas Lehigh – Spectrum*
58-58-413	Buda #3
58-58-418	Texas Lehigh - north of Centex
58-58-419	Monarch #2*
58-58-426	Lowden - Mobile Home
58-58-427	Demment
58-58-4CA	Callohon
58-58-4NM	Goforth Site D*
58-58-505	George Bowen
58-58-509	Chatlef Controls
58-58-510	Crestview - RV center*
58-58-712	April Lowe
67-01-310	Kyle PWS, south

* dry receptors noted

Table 3: Positive dye recovery at wells from receptors.

Map Number	Well Number	Well Name	Dye
1	58-50-511	Johnson	Eos
2	58-50-7DF	Denam	Eos
3	58-50-7LP	Polo	Eos
4	58-57-308	Huntington Estates	Eos
5	58-57-313	Clinton	Eos
6	58-57-3EG	Garza	Eos
7	58-57-3ES	Eric Swanson	Eos
8	58-57-3JY	Robinson	Eos
9	58-57-5T4	Ruby Ranch #4	Eos
10	58-57-606	Cindy Barton	Eos
11	58-57-610	Holt	Eos
12	58-57-6BP	Kathy	Eos
13	58-58-418	Texas Lehigh - north of Centex	Eos
14	58-58-426	Lowden - Mobile Home	Eos
15	58-50-4CA	Callahon	RWT

Table 4: San Marcos Springs (67-01-801) receptor results (springs listed from north to south).

Spring Name	Date/Time Placed	Date/Time Recovered	Fluorescein Results (ppb)	Eosine Results (ppb)	Field Notes/Comments
Crater Bottom	4/28 1400	5/4 1445	ND	ND	
Crater Bottom	5/4 1445	5/24 1000	ND	2.83	
Crater Bottom	5/24 1000	6/15 1130	ND	9.95	
Crater Bottom	6/15 1130	8/1 1030	ND	ND	
Weismueller Spring	4/28 1435	5/4 1452	ND	ND	
Weismueller Spring	5/4 1452	5/24 1010	ND	0.843	
Weismuller Spring	5/24 1010	6/15 1145	ND	1.67	
Weismuller Spring	6/15 1145	8/1 1045	1.33	ND	EAA dye
Diversion	4/28 1410	5/4 1500	ND	ND	
Diversion	5/4 1500	5/24 1020	ND	2.68	
Diversion	5/24 1020	6/15 1200	ND	4.48	
Diversion	6/15 1200	8/1 1115	12.7	ND	EAA dye
Deep Hole	4/28 1545	5/4 1515	ND	ND	
Deep Hole	5/4 1515	5/24 1030	ND	ND	
Deep Hole	5/24 1030	6/15 1215	ND	ND	
Deep Hole	6/15 1215	8/1 1130	1,460	ND	EAA dye
San Marcos Dam	4/28 1500	5/4 1410	ND	ND	
San Marcos Dam	5/4 1410	5/24 1230	ND	ND	
San Marcos Dam	5/24 1230	6/15 1345	ND	0.226	
San Marcos Dam	6/15 1345	8/1 1215	94.3	ND	EAA dye

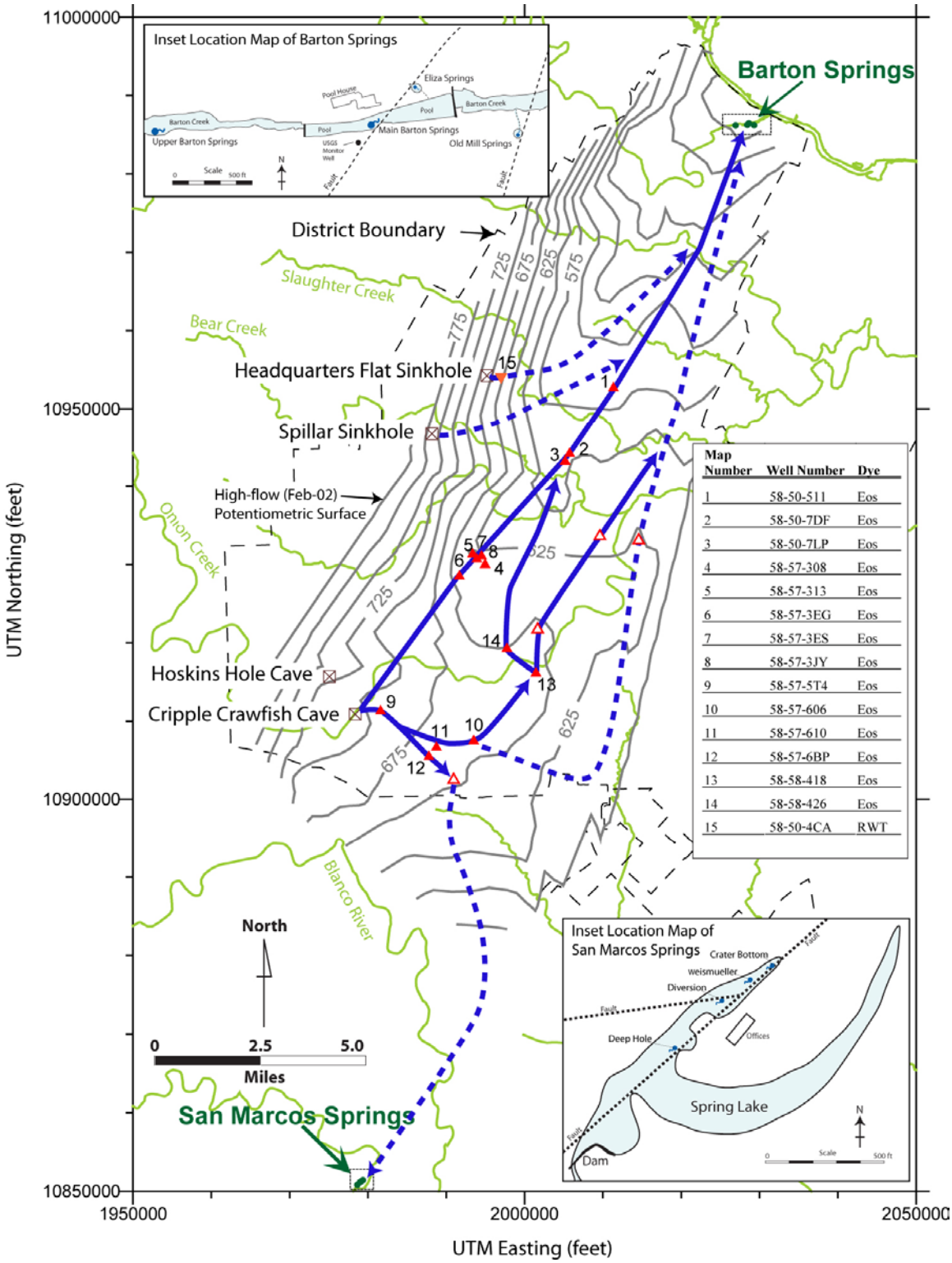

Figure 3: Summary map of groundwater-flow paths from this study. Dashed lines indicate inferred flow paths. Hollow triangles indicate positive dye recovery from wells of the 2002 dye trace (Hunt et al., 2005).

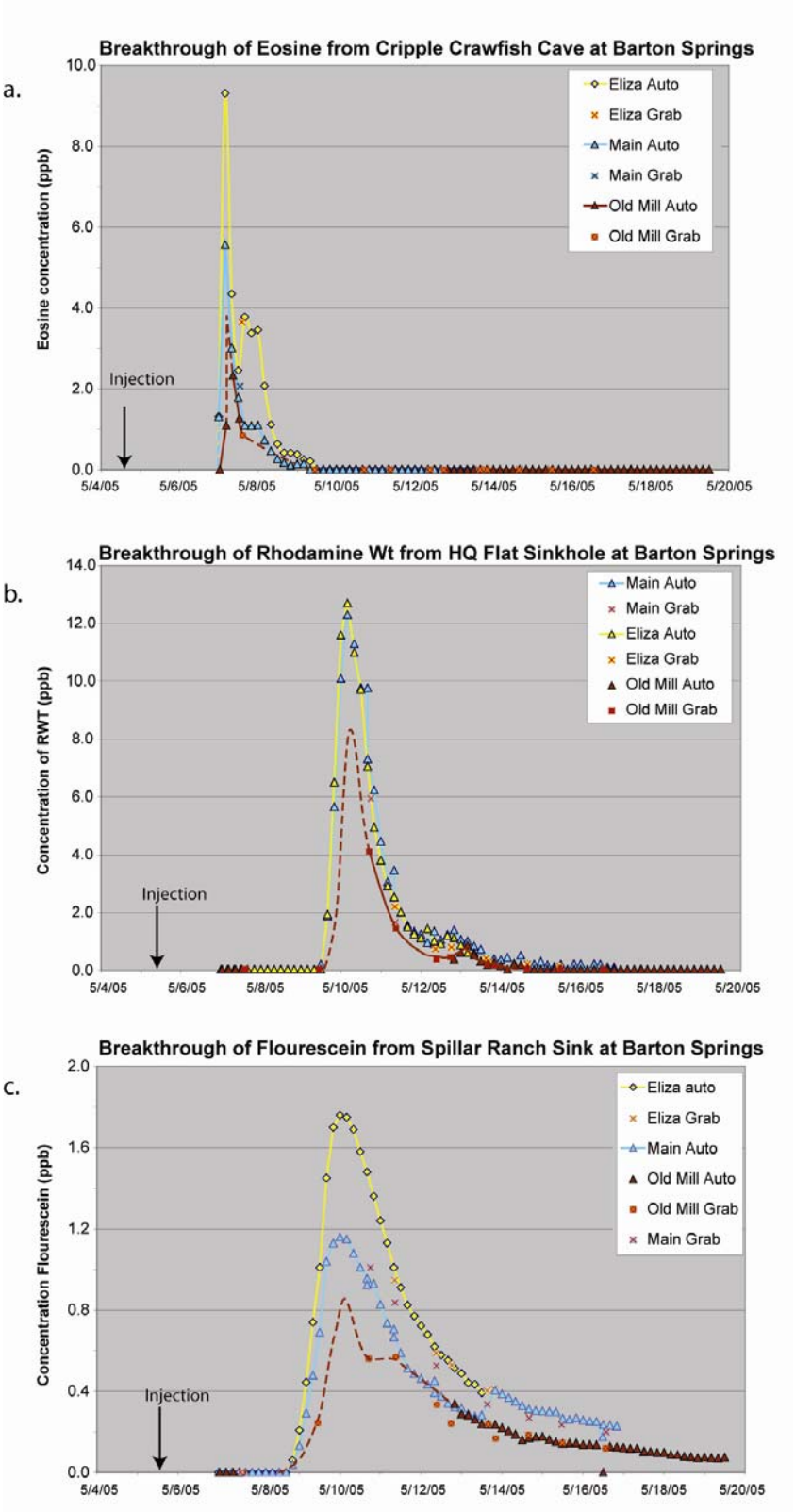

Figure 4: Dye breakthrough curves for Barton Springs. Breakthrough curve is dashed where inferred.

DISCUSSION

Results of the injections include documentation of a rapid groundwater flow rate of 7.4 miles per day from Cripple Crawfish Cave to Barton Springs, a straight-line distance of about 17.5 miles. Dye from the 2005 injection was detected at wells and both Barton and San Marcos Springs, although the concentrations at San Marcos were small compared to Barton Springs. The straight-line distance from Cripple Crawfish Cave to San Marcos Springs is about 11 miles. Dye concentrations from San Marcos Springs were not quantified with continuous grab samples, and the concentrations measured from the eluted charcoal were relatively low compared to the concentrations eluted from samples at Barton Springs. Dye from the 2002 injection of Cripple Crawfish was detected only at wells and Barton Springs. The relatively low concentrations of dye found at San Marcos Springs in 2005 and the absence of dye in 2002 indicate that the majority of recharge from the Onion Creek area flows toward Barton Springs.

Both the 2002 and 2005 injections were conducted during relatively high-flow conditions in the aquifer. However, aquifer conditions in the San Antonio segment of the Edwards Aquifer were generally higher during the 2002 trace than the 2005 trace. Hydraulic heads in the aquifer are influenced by the amount of water recharging major recharge features. With significantly lower flows in the Blanco River in 2005, there would be less recharge to this part of the aquifer and therefore lower heads. With relatively higher heads near Onion Creek or around recharge features, dye injected into Cripple Crawfish Cave would have an increased potential to flow toward the Blanco River and San Marcos Springs. Positive dye recoveries from wells located SSE of the injection site toward San Marcos Springs support this hypothesis. Local mounding in the potentiometric surface around recharge features has been documented in the study area (Hunt et al., 2005). These results indicate that the groundwater divide separating the Barton Springs and San Antonio segments may fluctuate according to hydraulic head conditions.

Results from wells in this study support 2002 data documenting groundwater flow routes occurring in the eastern and confined portion of the Barton Springs segment (**Figure 3**). Other studies have postulated a significant preferential flow path along the saline zone boundary (Hauwert et al., 2004).

Bifurcation of groundwater flow is well documented from dye detections in wells in this study and previous studies (Hauwert et al., 2004; Hunt et al., 2005). Bifurcation of flow is also presumed to result in multiple peak concentrations on breakthrough curves as pulses of dye arrive at different times at the springs (**Figure 4a**). This suggests that bifurcation of groundwater flow may increase in probability the closer in proximity to the southern groundwater divide south of Onion Creek.

Breakthrough concentrations of dye arriving at the three major spring outlets at Barton Springs were variable in this study (**Figures 4a-c**); although grab samples at Old Mill are not continuous and can't be compared directly. One notable exception to the variability is the concentration of RWT, which discharged at the same concentration at Eliza and Main Barton Springs. This may suggest that the flow path from HQ Flat Sinkhole is shared by both springs. Possible explanations for the variable concentrations include dilution from other contributing groundwater basins or the route and distance of travel to each spring.

CONCLUSIONS

- Rapid groundwater flow rates from creek and upland recharge features to Barton Springs were documented and ranged from 2.3 to 7.4 miles per day under relatively high-flow conditions.
- Dye tracing from a recharge feature in Onion Creek indicates that there is a hydraulic connection between Onion Creek and San Marcos Springs under the particular set of conditions during the study.
- When compared to previous studies, these results indicate that the location of the groundwater divide separating flow between San Marcos and Barton Springs may fluctuate according to hydraulic conditions of the Blanco River and Onion Creek.
- Groundwater flow routes were further documented in the eastern confined portion of the aquifer.

FUTURE STUDIES

Additional studies and quantitative dye tracing are needed to better understand the southern groundwater divide. A duplicate dye trace should be conducted from Cripple Crawfish Cave during similar hydraulic conditions. Continuous automatic samplers should be installed at San Marcos Springs to refine break through curves.

ACKNOWLEDGEMENTS

This work was done with close collaboration between the BSEACD and the COA. The COA collected and paid Barton Springs samples. The BSEACD collected and paid for the analyses of water well and San Marcos Springs samples.

Mark Saunders and Scott Heirs (COA) injected SRB into Hoskins Hole. Mark Saunders (COA) injected eosine dye into Cripple Crawfish Cave. Adrian Lindley (UT-Austin) injected RWT into Headquarter Flat Sinkhole. Scott Hiers and Sylvia Pope injected fluorescein into Spillar Sinkhole. The UT Bureau of Economic Geology provided the water truck used to flush the dyes. David Johns and Nico Hauwert retrieved samples from Barton Springs. Joe Beery and John Dupnik (BSEACD) collected receptors from wells and sent samples to OUL for analysis. BSEACD staff Brian Smith, Brian Hunt, Joe Beery, and John Dupnik retrieved samples from San Marcos Springs.

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Results from this study were presented as a poster at the Austin Geological Society's annual poster session on March 6, 2006.

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Appendix: Dye Analysis Results (OUL Labs)

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results		RWT Results	
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Eliza	Eliza Spring	A	Water	5/7/05 0:00	ND	0.0	534.6	1.3	ND	0.1
Eliza	Eliza Spring	A	Water	5/7/05 4:00	ND	0.0	534.6	9.3	ND	0.1
Eliza	Eliza (B3)	A	Water	5/7/05 8:00	ND	0.0	534.7	4.4	ND	0.1
Eliza	Eliza (B4)	A	Water	5/7/05 12:00	ND	0.0	534.7	2.5	ND	0.1
Eliza	Eliza (B5)	A	Water	5/7/05 16:00	ND	0.0	534.7	3.8	ND	0.1
Eliza	Eliza (B6)	A	Water	5/7/05 20:00	ND	0.0	534.7	3.4	ND	0.1
Eliza	Eliza (B7)	A	Water	5/8/05 0:00	ND	0.0	534.7	3.5	ND	0.1
Eliza	Eliza (B8)	A	Water	5/8/05 4:00	ND	0.0	534.9	2.1	ND	0.1
Eliza	Eliza (B9)	A	Water	5/8/05 8:00	ND	0.0	534.7	1.1	ND	0.1
Eliza	Eliza (B10)	A	Water	5/8/05 12:00	ND	0.0	534.9	0.6	ND	0.1
Eliza	Eliza (B11)	A	Water	5/8/05 16:00	ND	0.0	535.0	0.4	ND	0.1
Eliza	Eliza (B12)	A	Water	5/8/05 20:00	511.1	0.1	534.7	0.4	ND	0.1
Eliza	Eliza (B13)	A	Water	5/9/05 0:00	509.1	0.2	534.0	0.4	ND	0.1
Eliza	Eliza (B14)	A	Water	5/9/05 4:00	508.8	0.4	534.2	0.3	ND	0.1
Eliza	Eliza (B15)	A	Water	5/9/05 8:00	508.7	0.7	534.8 (1)	0.2	ND	0.1
Eliza	Eliza (B16)	A	Water	5/9/05 12:00	508.8	1.0	ND	0.0	ND	0.1
Eliza	Eliza (B1)	A	Water	5/9/05 16:00	508.6	1.5	ND	0.0	574.6	1.9
Eliza	Eliza (B2)	A	Water	5/9/05 20:00	508.5	1.7	ND	0.0	574.6	6.5
Eliza	Eliza (B3)	A	Water	5/10/05 0:00	508.6	1.8	ND	0.0	574.7	11.6
Eliza	Eliza (B4)	A	Water	5/10/05 4:00	508.5	1.8	ND	0.0	574.5	12.7
Eliza	Eliza (B5)	A	Water	5/10/05 8:00	508.5	1.7	ND	0.0	574.5	11.0
Eliza	Eliza (B6)	A	Water	5/10/05 12:00	508.6	1.6	ND	0.0	574.7	9.7
Eliza	Eliza (B7)	A	Water	5/10/05 16:00	508.5	1.5	ND	0.0	574.7	7.1
Eliza	Eliza (B8)	A	Water	5/10/05 20:00	508.5	1.4	ND	0.0	574.7	5.0
Eliza	Eliza (B9)	A	Water	5/11/05 0:00	508.4	1.2	ND	0.0	574.9	3.8
Eliza	Eliza (B10)	A	Water	5/11/05 4:00	508.5	1.1	ND	0.0	574.9	2.9
Eliza	Eliza (B11)	A	Water	5/11/05 8:00	508.5	1.0	ND	0.0	574.8	2.6
Eliza	Eliza (B12)	A	Water	5/11/05 12:00	508.5	0.9	ND	0.0	575.1	2.0
Eliza	Eliza (B13)	A	Water	5/11/05 16:00	508.5	0.8	ND	0.0	575.1	1.5
Eliza	Eliza (B14)	A	Water	5/11/05 20:00	508.4	0.8	ND	0.0	575.3	1.3
Eliza	Eliza (B15)	A	Water	5/12/05 0:00	508.6	0.7	ND	0.0	575.2	1.1

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results		RWT Results	
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Eliza	Eliza (B16)	A	Water	5/12/05 4:00	508.5	0.7	ND	0.0	575.2	1.5
Eliza	Eliza (B17)	A	Water	5/12/05 8:00	508.5	0.6	ND	0.0	575.5	1.0
Eliza	Eliza (B18)	A	Water	5/12/05 12:00	508.6	0.6	ND	0.0	575.3	0.9
Eliza	Eliza (B19)	A	Water	5/12/05 16:00	508.6	0.6	ND	0.0	575.1	1.2
Eliza	Eliza (B20)	A	Water	5/12/05 20:00	508.6	0.5	ND	0.0	575.6	1.1
Eliza	Eliza (B21)	A	Water	5/13/05 0:00	508.7	0.5	ND	0.0	575.7	0.9
Eliza	Eliza (B22)	A	Water	5/13/05 4:00	508.6	0.4	ND	0.0	575.5	0.6
Eliza	Eliza (B23)	A	Water	5/13/05 8:00	508.7	0.4	ND	0.0	576.3	0.6
Eliza	Eliza (B24)	A	Water	5/13/05 12:00	508.5	0.4	ND	0.0	574.8	0.3
Eliza	Eliza (grab)	G	Water	5/7/05 14:15	ND	0.0	534.7	3.7	ND	0.1
Eliza	Eliza Spring	G	Water	5/11/05 8:25	508.8	0.9	ND	0.0	574.8	2.2
Eliza	Eliza Spring	G	Water	5/12/05 8:50	508.6	0.6	ND	0.0	575.5	0.8
Eliza	Eliza (grab)	G	Water	5/12/05 18:15	508.5	0.5	ND	0.0	575.3	0.8
Eliza	Eliza Spring	G	Water	5/13/05 15:10	508.8	0.4	ND	0.0	576.2	0.4
Eliza	Eliza (grab)	G	Water	5/13/05 19:30	508.8	0.4	ND	0.0	574.8	0.3
Eliza	Eliza Spring	G	Water	5/14/05 15:55	508.7	0.3	ND	0.0	577.8	0.2
Eliza	Eliza Spring	G	Water	5/15/05 11:15	508.6	0.3	ND	0.0	577.0 (1)	0.2
Eliza	Eliza Spring	G	Water	5/16/05 13:35	508.7	0.2	ND	0.0	ND	0.1
Main	Main (B1)	A	Water	5/7/05 0:00	ND	0.0	534.9	1.3	ND	0.1
Main	Main (B2)	A	Water	5/7/05 4:00	ND	0.0	534.7	5.6	ND	0.1
Main	Main (B3)	A	Water	5/7/05 8:00	ND	0.0	534.7	3.0	ND	0.1
Main	Main (B4)	A	Water	5/7/05 12:00	ND	0.0	534.9	1.8	ND	0.1
Main	Main (B5)	A	Water	5/7/05 16:00	ND	0.0	535.2	1.1	ND	0.1
Main	Main (B6)	A	Water	5/7/05 20:00	ND	0.0	535.3	1.1	ND	0.1
Main	Main (B7)	A	Water	5/8/05 0:00	ND	0.0	535.1	1.1	ND	0.1
Main	Main (B8)	A	Water	5/8/05 4:00	ND	0.0	535.1	0.7	ND	0.1
Main	Main (B9)	A	Water	5/8/05 8:00	ND	0.0	535.3	0.5	ND	0.1
Main	Main (B10)	A	Water	5/8/05 12:00	ND	0.0	535.0	0.3	ND	0.1
Main	Main (B11)	A	Water	5/8/05 16:00	ND	0.0	535.7	0.2	ND	0.1
Main	Main (B12)	A	Water	5/8/05 20:00	511.6	0.0	536.3	0.1	ND	0.1
Main	Main (B13)	A	Water	5/9/05 0:00	509.0	0.1	534.2	0.1	ND	0.1
Main	Main (B14)	A	Water	5/9/05 4:00	508.7	0.3	534.8 (1)	0.2	ND	0.1
Main	Main (B15)	A	Water	5/9/05 8:00	508.7	0.5	ND	0.0	ND	0.1
Main	Main (B16)	A	Water	5/9/05 12:00	508.6	0.7	ND	0.0	575.6 (1)	0.2

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results		RWT Results	
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Main	Main (B1)	A	Water	5/9/05 16:00	508.8	1.0	ND	0.0	575.5	1.9
Main	Main (B2)	A	Water	5/9/05 20:00	508.7	1.1	ND	0.0	574.6	5.7
Main	Main (B3)	A	Water	5/10/05 0:00	508.7	1.2	ND	0.0	574.7	10.1
Main	Main (B4)	A	Water	5/10/05 4:00	508.7	1.2	ND	0.0	574.7	12.3
Main	Main (B5)	A	Water	5/10/05 8:00	508.7	1.1	ND	0.0	574.7	11.3
Main	Main (B6)	A	Water	5/10/05 12:00	508.7	1.0	ND	0.0	574.7	9.8
Main	Main Barton B7	A	Water	5/10/05 16:00	508.5	1.0	ND	0.0	574.9	9.8
Main	Main (B7)	A	Water	5/10/05 16:00	508.7	0.9	ND	0.0	574.9	7.3
Main	Main (B8)	A	Water	5/10/05 20:00	509.1	0.9	ND	0.0	574.9	6.2
Main	Main (B9)	A	Water	5/11/05 0:00	508.8	0.8	ND	0.0	575.1	4.5
Main	Main (B10)	A	Water	5/11/05 4:00	508.8	0.7	ND	0.0	575.1	3.1
Main	Main Barton B11	A	Water	5/11/05 8:00	508.5	0.7	ND	0.0	575.2	3.5
Main	Main (B11)	A	Water	5/11/05 8:00	508.9	0.7	ND	0.0	575.2	2.5
Main	Main (B12)	A	Water	5/11/05 12:00	508.7	0.6	ND	0.0	575.2	2.0
Main	Main (B13)	A	Water	5/11/05 16:00	508.7	0.5	ND	0.0	575.7	1.6
Main	Main (B14)	A	Water	5/11/05 20:00	508.6	0.5	ND	0.0	576.1	1.4
Main	Main (B15)	A	Water	5/12/05 0:00	508.8	0.5	ND	0.0	576.2	1.3
Main	Main (B16)	A	Water	5/12/05 4:00	508.7	0.4	ND	0.0	575.5	1.0
Main	Main Barton B17	A	Water	5/12/05 8:00	508.6	0.5	ND	0.0	575.7	1.4
Main	Main (B17)	A	Water	5/12/05 8:00	508.7	0.4	ND	0.0	575.3	0.9
Main	Main (B18)	A	Water	5/12/05 12:00	509.1	0.4	ND	0.0	575.9	1.1
Main	Main (B19)	A	Water	5/12/05 16:00	508.7	0.3	ND	0.0	575.7	1.3
Main	Main (B20)	A	Water	5/12/05 20:00	508.7	0.3	ND	0.0	575.6	1.4
Main	Main (B21)	A	Water	5/13/05 0:00	508.9	0.3	ND	0.0	575.7	1.1
Main	Main (B22)	A	Water	5/13/05 4:00	508.7	0.3	ND	0.0	576.2	1.0
Main	Main (B23)	A	Water	5/13/05 8:00	508.8	0.3	ND	0.0	577.3	0.9
Main	Main (B24)	A	Water	5/13/05 12:00	508.8	0.3	ND	0.0	576.3	0.7
Main	Main Barton	A	Water	5/13/05 20:00	508.9	0.4	ND	0.0	575.8	0.4
Main	Main Barton	A	Water	5/14/05 0:00	508.5	0.4	ND	0.0	577.0	0.4
Main	Main Barton	A	Water	5/14/05 4:00	508.5	0.4	ND	0.0	578.4 (2)	0.5
Main	Main Barton	A	Water	5/14/05 8:00	508.8	0.4	ND	0.0	574.6 (2)	0.3
Main	Main Barton	A	Water	5/14/05 12:00	508.5	0.3	ND	0.0	579.2 (2)	0.5
Main	Main Barton	A	Water	5/14/05 16:00	508.5	0.3	ND	0.0	578.0 (2)	0.2
Main	Main Barton	A	Water	5/14/05 20:00	508.6	0.3	ND	0.0	580.6 (2)	0.2

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results		RWT Results	
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Main	Main Barton	A	Water	5/15/05 0:00	508.6	0.3	ND	0.0	579.6 (2)	0.3
Main	Main Barton	A	Water	5/15/05 4:00	508.6	0.3	ND	0.0	575.4 (2)	0.2
Main	Main Barton	A	Water	5/15/05 8:00	508.5	0.3	ND	0.0	577.6 (2)	0.1
Main	Main Barton	A	Water	5/15/05 12:00	508.7	0.3	ND	0.0	578.8 (2)	0.2
Main	Main Barton	A	Water	5/15/05 16:00	508.3	0.3	ND	0.0	ND	0.1
Main	Main Barton	A	Water	5/15/05 20:00	508.9	0.3	ND	0.0	579.6 (2)	0.2
Main	Main Barton	A	Water	5/16/05 0:00	508.9	0.3	ND	0.0	576.6 (2)	0.2
Main	Main Barton	A	Water	5/16/05 4:00	508.9	0.3	ND	0.0	ND	0.1
Main	Main Barton	A	Water	5/16/05 8:00	508.5	0.3	ND	0.0	579.2 (2)	0.2
Main	Main Barton	A	Water	5/16/05 11:40	508.4	0.2	ND	0.0	577.0 (2)	0.2
Main	Main Barton	A	Water	5/16/05 12:00	508.4	0.2	ND	0.0	ND	0.1
Main	Main Barton	A	Water	5/16/05 16:00	508.6	0.2	ND	0.0	575.6 (2)	0.1
Main	Main Barton	A	Water	5/16/05 20:00	508.7	0.2	ND	0.0	577.8 (2)	0.1
Main	Main (Grab)	G	Water	5/7/05 13:00	ND	0.0	534.8	2.1	ND	0.1
Main	Main (Grab)	G	Water	5/10/05 18:00	508.6	1.0	ND	0.0	574.9	6.0
Main	Main	G	Water	5/11/05 8:35	508.9	0.8	ND	0.0	575.0	1.7
Main	Main	G	Water	5/12/05 9:05	508.8	0.5	ND	0.0	575.6	0.8
Main	Main	G	Water	5/13/05 15:20	508.9	0.3	ND	0.0	574.8	0.3
Main	Main	G	Water	5/14/05 16:05	508.7	0.3	ND	0.0	576.5 (1)	0.1
Main	Main	G	Water	5/15/05 11:20	508.8	0.2	ND	0.0	ND	0.1
Main	Main	G	Water	5/16/05 13:45	509.0	0.2	ND	0.0	ND	0.1
Old Mill	Old Mill (B9)	A	Water	5/7/05 0:41	ND	0.00	ND	0.0	ND	0.1
Old Mill	Old Mill (B10)	A	Water	5/7/05 4:41	ND	0.00	534.5	1.1	ND	0.1
Old Mill	Old Mill (B11)	A	Water	5/7/05 8:41	ND	0.00	534.7	2.3	ND	0.1
Old Mill	Old Mill (B12)	A	Water	5/7/05 12:41	ND	0.00	534.8	1.3	ND	0.1
Old Mill	Old Mill (B1)	A	Water	5/12/05 20:00	508.5	0.34	ND	0.0	577.4	0.4
Old Mill	Old Mill (B2)	A	Water	5/13/05 0:00	508.8	0.29	ND	0.0	575.9	0.6
Old Mill	Old Mill (B3)	A	Water	5/13/05 4:00	508.5	0.28	ND	0.0	575.6	0.9
Old Mill	Old Mill (B4)	A	Water	5/13/05 8:00	508.6	0.26	ND	0.0	575.8	0.5
Old Mill	Old Mill (B5)	A	Water	5/13/05 12:00	508.7	0.24	ND	0.0	575.6	0.3
Old Mill	Old Mill (B6)	A	Water	5/13/05 16:00	508.5	0.24	ND	0.0	575.2	0.2
Old Mill	Old Mill (B7)	A	Water	5/13/05 20:00	508.7	0.24	ND	0.0	578.0	0.3
Old Mill	Old Mill (B8)	A	Water	5/14/05 0:00	508.5	0.22	ND	0.0	577.8 (1)	0.2
Old Mill	Old Mill (B9)	A	Water	5/14/05 4:00	508.9	0.21	ND	0.0	ND	0.1

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results			
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Old Mill	Old Mill (B10)	A	Water	5/14/05 8:00	508.6	0.19	ND	0.0	578.0 (1)	0.2
Old Mill	Old Mill (B11)	A	Water	5/14/05 12:00	508.9	0.16	ND	0.0	577.4 (1)	0.2
Old Mill	Old Mill (B12)	A	Water	5/14/05 16:00	508.5	0.17	ND	0.0	ND	0.1
Old Mill	Old Mill (B13)	A	Water	5/14/05 20:00	508.7	0.18	ND	0.0	ND	0.1
Old Mill	Old Mill (B14)	A	Water	5/15/05 0:00	508.9	0.18	ND	0.0		0.1
Old Mill	Old Mill (B15)	A	Water	5/15/05 4:00	508.7	0.16	ND	0.0	ND	0.1
Old Mill	Old Mill (B16)	A	Water	5/15/05 8:00	509.5	0.15	ND	0.0	ND	0.1
Old Mill	Old Mill (B17)	A	Water	5/15/05 12:00	508.8	0.14	ND	0.0	ND	0.1
Old Mill	Old Mill (B18)	A	Water	5/15/05 16:00	508.9	0.15	ND	0.0	ND	0.1
Old Mill	Old Mill (B19)	A	Water	5/15/05 20:00	508.7	0.15	ND	0.0	ND	0.1
Old Mill	Old Mill (B20)	A	Water	5/16/05 0:00	508.7	0.14	ND	0.0	ND	0.1
Old Mill	Old Mill (B21)	A	Water	5/16/05 4:00	508.9	0.14	ND	0.0	ND	0.1
Old Mill	Old Mill (B22)	A	Water	5/16/05 8:00	508.9	0.14	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/16/05 12:00	ND	0.00	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/16/05 16:00	508.5	0.13	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/16/05 20:00	508.4	0.13	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 0:00	508.7	0.12	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 4:00	508.9	0.12	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 8:00	508.7	0.12	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 12:00	509.0	0.10	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 12:20	508.8	0.11	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 16:00	508.6	0.10	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/17/05 20:00	508.9	0.10	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 0:00	508.7	0.10	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 4:00	508.5	0.09	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 8:00	508.9	0.09	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 12:00	509.0	0.08	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 16:00	509.2	0.08	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/18/05 20:00	509.4	0.07	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/19/05 0:00	508.3	0.08	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/19/05 4:00	509.2	0.07	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/19/05 8:00	508.9	0.07	ND	0.0	ND	0.1
Old Mill	Old Mill	A	Water	5/19/05 12:00	509.1	0.08	ND	0.0	ND	0.1
Old Mill	Old Mill (grab)	G	Water	5/7/05 14:40	ND	0.00	534.9	0.9	ND	0.1

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results			
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Old Mill	Old Mill (grab)	G	Water	5/9/05 10:50	508.5	0.25	ND	0.0	ND	0.1
Old Mill	Old Mill (grab)	G	Water	5/10/05 17:00	508.6	0.56	ND	0.0	574.8	4.1
Old Mill	Old Mill Spring	G	Water	5/11/05 9:05	508.7	0.57	ND	0.0	575.5	1.5
Old Mill	Old Mill Spring	G	Water	5/12/05 9:25	508.5	0.34	ND	0.0	576.8	0.4
Old Mill	Old Mill (grab)	G	Water	5/12/05 17:45	508.5	0.24	ND	0.0	575.8	0.5
Old Mill	Old Mill Spring	G	Water	5/13/05 15:50	508.8	0.24	ND	0.0	576.6 (1)	0.2
Old Mill	Old Mill (grab)	G	Water	5/13/05 20:15	508.6	0.17	ND	0.0	577.2 (1)	0.2
Old Mill	Old Mill Spring	G	Water	5/14/05 15:40	508.7	0.19	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	G	Water	5/15/05 11:45	508.7	0.15	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	G	Water	5/16/05 13:20	508.9	0.12	ND	0.0	ND	0.1
City of Austin Control	City of Austin Control	R	6/16/05 10:55	6/16/05 12:00	ND	0.00	ND	0.0	ND	0.1
Main	Main Barton	R	6/2/05 14:45	6/16/05 11:25	515.6	107.0	ND	0.0	571.4	23.8
Eliza	Eliza	R	6/2/05 14:35	6/16/05 11:15	515.7	114.0	ND	0.0	570.6	35.2
Old Mill	Old Mill	R	6/2/05 14:20	6/16/05 10:55	515.7	71.2	ND	0.0	570.7	18.3
Main	Main Barton	R	5/26/05 14:10	6/2/05 14:45	515.9	148.0	ND	0.0	570.8	28.1
Creek Bypass	Barton Creek Bypass	R	5/26/05 13:55	6/16/05 11:50	ND	0.0	ND	0.0	ND	0.1
Upper	Upper Barton	R	5/26/05 13:45	6/16/05 11:45	ND	0.0	541.2	4.8	ND	0.1
Eliza	Eliza	R	5/26/05 13:25	6/2/05 14:35	515.9	194.0	ND	0.0	570.1	36.5
Old Mill	Old Mill	R	5/26/05 13:10	6/2/05 14:20	516.0	112.0	ND	0.0	570.4	19.5
Main	Main Barton	R	5/23/05 8:50	5/26/05 14:10	515.7	153.0	ND	0.0	570.7	28.9
Eliza	Eliza	R	5/23/05 8:10	5/26/05 13:25	515.7	153.0	ND	0.0	570.2	26.9
Old Mill	Old Mill	R	5/23/05 7:55	5/26/05 13:10	515.7	91.4	ND	0.0	570.7	16.6
Main	Main Barton	R	5/20/05 10:45	5/23/05 8:50	515.6	177.0	ND	0.0	570.6	41.4
Eliza	Eliza	R	5/20/05 10:25	5/23/05 8:10	515.6	210.0	ND	0.0	570.8	57.0
Old Mill	Old Mill	R	5/20/05 10:10	5/23/05 7:55	515.8	117.0	ND	0.0	570.2	28.7
Main	Main Barton	R	5/19/05 13:10	5/20/05 10:45	515.7	83.0	ND	0.0	570.5	22.2
Eliza	Eliza	R	5/19/05 12:55	5/20/05 10:25	515.5	112.0	ND	0.0	570.7	30.3
Old Mill	Old Mill	R	5/19/05 12:40	5/20/05 10:10	515.7	68.1	ND	0.0	570.3	22.4
City of Austin Control	City of Austin Control	R	5/17/05 12:20	5/17/05 12:50	ND	0.0	ND	0.0	ND	0.1
Main	Barton Springs (Main)	R	5/16/05 13:45	5/17/05 12:45	515.7	150.0	ND	0.0	570.3	33.6
Eliza	Eliza Spring	R	5/16/05 13:25	5/17/05 12:30	515.6	187.0	ND	0.0	570.1	43.8
City of Austin Control	City of Austin Control	R	5/16/05 13:20	5/16/05 13:55	ND	0.0	ND	0.0	ND	0.1

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results			
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Old Mill	Old Mill Spring	R	5/16/05 13:20	5/17/05 12:20	515.7	115.0	ND	0.0	570.3	23.1
Control (NH)	Control (NH)	R	5/16/05 10:00	5/16/05 12:00	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/15/05 11:45	5/16/05 13:20	515.7	199.0	ND	0.0	569.9	61.9
Main	Barton Springs (Main)	R	5/15/05 11:20	5/16/05 13:45	517.3	289.0	ND	0.0	569.9	66.3
City of Austin Control	City of Austin Control	R	5/15/05 11:15	5/15/05 11:50	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	5/15/05 11:15	5/16/05 13:35	515.7	308.0	ND	0.0	569.9	87.0
Main	Barton Springs (Main)	R	5/14/05 16:05	5/15/05 11:20	515.5	220.0	ND	0.0	570.0	58.2
Eliza	Eliza Spring	R	5/14/05 15:55	5/15/05 11:15	515.9	211.0	ND	0.0	570.2	65.4
City of Austin Control	City of Austin Control	R	5/14/05 15:40	5/14/05 16:10	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/14/05 15:40	5/15/05 11:45	515.7	200.0	ND	0.0	569.9	63.0
Old Mill	Old Mill Spring	R	5/13/05 15:50	5/14/05 15:40	515.7	263.0	ND	0.0	569.9	121.0
Main	Barton Springs (Main)	R	5/13/05 15:20	5/14/05 16:05	515.5	310.0	ND	0.0	570.3	111.0
City of Austin Control	City of Austin Control	R	5/13/05 15:10	5/13/05 15:55	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	5/13/05 15:10	5/14/05 15:55	515.9	320.0	ND	0.0	569.3	115.0
Old Mill	Old Mill Spring	R	5/12/05 9:25	5/13/05 15:50	515.9	419.0	ND	0.0	569.6	325.0
Main	Barton Springs (Main)	R	5/12/05 9:05	5/13/05 15:20	517.1	546.0	ND	0.0	569.9	289.0
City of Austin Control	City of Austin Control	R	5/12/05 8:50	5/12/05 9:30	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	5/12/05 8:50	5/13/05 15:10	517.3	477.0	ND	0.0	569.4	328.0
Old Mill	Old Mill Spring	R	5/11/05 9:05	5/12/05 9:25	517.0	629.0	ND	0.0	569.9	431.0
Main	Barton Springs (Main)	R	5/11/05 8:35	5/12/05 9:05	516.9	648.0	ND	0.0	569.8	300.0
City of Austin Control	City of Austin Control	R	5/11/05 8:25	5/11/05 9:10	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	5/11/05 8:25	5/12/05 8:50	517.0	831.0	ND	0.0	570.3	361.0
Creek Bypass	Barton Creek Bypass	R	5/10/05 12:30	5/26/05 13:55	ND	0.0	ND	0.0	ND	0.1
Main	Barton Springs (Main)	R	5/10/05 12:10	5/11/05 8:35	517.1	1270.0	ND	0.0	568.8	1070.0
Eliza	Eliza Spring	R	5/10/05 12:00	5/11/05 8:25	517.1	842.0	ND	0.0	569.9	993.0
City of Austin Control	City of Austin Control	R	5/10/05 11:45	5/10/05 12:30	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/10/05 11:45	5/11/05 9:05	515.9	386.0	ND	0.0	569.4	519.0
Main	Barton Springs (Main)	R	5/9/05 14:50	5/10/05 12:10	517.1	1020.0	ND	0.0	569.7	1210.0
Eliza	Eliza Spring	R	5/9/05 14:35	5/10/05 12:00	517.1	703.0	ND	0.0	570.1	1080.0
City of Austin	City of Austin Control	R	5/9/05 14:25	5/9/05 14:55	ND	0.0	ND	0.0	ND	0.1

General Station	Specific Station	Sample	Date/Time	Date/Time	Fluorescein Results		Eosine Results		RWT Results	
Name	Name	Type	Placed	Recovered	Peak nm	Conc. ppb	Peak nm	Conc. ppb	Peak nm	Conc. ppb
Control										
Old Mill	Old Mill Spring	R	5/9/05 14:25	5/10/05 11:45	516.9	736.0	ND	0.0	569.6	1060.0
Main	Barton Springs (Main)	R	5/8/05 17:10	5/9/05 14:50	515.5	340.0	540.4 *	41.7	568.0 **	16.5
Eliza	Eliza Spring	R	5/8/05 10:30	5/9/05 14:35	515.6	307.0	540.6	67.7	ND	0.1
City of Austin Control	City of Austin Control	R	5/8/05 10:15	5/8/05 17:15	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/8/05 10:15	5/9/05 14:25	515.9	142.0	539.4	65.8	ND	0.1
Main	Barton Springs (Main)	R	5/7/05 12:10	5/8/05 17:10	ND	0.0	541.1	432.0	ND	0.1
Eliza	Eliza Spring	R	5/7/05 12:00	5/8/05 10:30	ND	0.0	541.0	273.0	ND	0.1
City of Austin Control	City of Austin Control	R	5/7/05 11:45	5/7/05 12:15	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/7/05 11:45	5/8/05 10:15	ND	0.0	541.0	359.0	ND	0.1
Control (NH)	Control (NH)	R	5/6/05 17:30	5/7/05 15:30	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	5/6/05 8:50	5/7/05 11:45	ND	0.0	541.1	254.0	ND	0.1
Main	Barton Springs (Main)	R	5/6/05 8:20	5/7/05 12:10	ND	0.0	541.2	409.0	ND	0.1
Eliza	Eliza Spring	R	5/6/05 8:10	5/7/05 12:00	ND	0.0	541.1	267.0	ND	0.1
Old Mill	Old Mill Spring	R	5/3/05 12:35	5/6/05 8:50	ND	0.0	ND	0.0	ND	0.1
Upper	Upper Barton	R	5/3/05 12:30	5/26/05 13:45	ND	0.0	541.5	2.0	ND	0.1
Main	Barton Springs (Main)	R	5/3/05 11:15	5/6/05 8:20	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	5/3/05 9:55	5/6/05 8:10	ND	0.0	ND	0.0	ND	0.1
Old Mill	Old Mill Spring	R	4/28/05 12:10	5/3/05 12:35	ND	0.0	ND	0.0	ND	0.1
Upper	Upper Barton Spring	R	4/28/05 11:35	5/3/05 12:20	ND	0.0	542.4 (1)	0.3	ND	0.1
Main	Barton Springs (Main)	R	4/28/05 10:45	5/3/05 11:15	ND	0.0	ND	0.0	ND	0.1
Eliza	Eliza Spring	R	4/28/05 10:10	5/3/05 9:55	ND	0.0	ND	0.0	ND	0.1

FOOTNOTES:
ND = No dye detected
* = Eosine dye is present in this sample but, due to a greater concentration of another dye, the eosine dye concentration cannot be accurately calculated.
** = RWT dye is present in this sample but, due to a greater concentration of another dye, the RWT dye cannot be accurately calculated.
(1) = A fluorescent peak is present which does not meet all the criteria for a positive dye result. However, it has been calculated as though it were the tracer dye.
A= Automatic Sampler
G= Grab Sample
R= Receptor