

URBAN PESTICIDE MONITORING

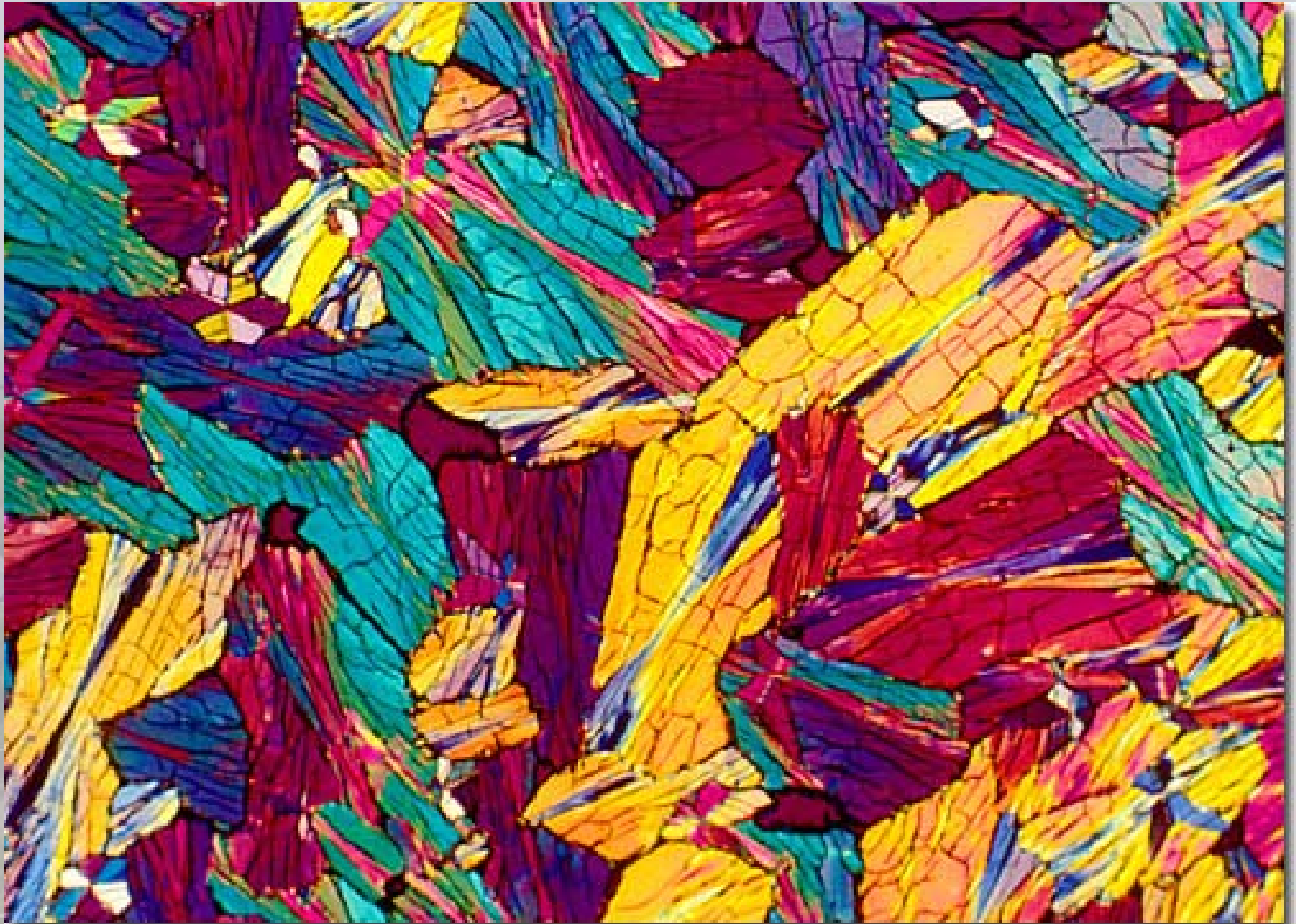
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CHANGING TO DAYLIGHT SAVING TIME and other absurdities in life



Atrazine Photo-Micrograph



OUTLINE

•Introduction & Background

- Pesticide Monitoring Programs in Texas
- Pesticides of Interest
- Data Gaps

•Groundwater Monitoring for Urban Pesticides

- Immunoassay Kits
- Cooperative Monitoring
- Sampling & Analysis
- Analytical Results

•Conclusions & Recommendations



Introduction & Background

- **Pesticide Monitoring Programs in Texas**
- **Pesticides of Interest (POIs)**
- **Data Gaps**



Pesticide Monitoring Programs in Texas

- Vulnerable Areas
- PWS-POEs
- Investigations and On-Going Monitoring of PWS Wells With High Atrazine Detects
- Cooperative Ambient Monitoring (Atr.& Met.)
- Urban Pesticide Monitoring (New in 2007)



Pesticides of Interest

- **USGS Pesticide Synthesis Report 2006**
 - Diazinon, Chlorpyrifos, Malathion-Urban
 - Azinphos-Methyl, Chlorpyrifos-Ag
 - Expensive Lab Analysis
 - National Findings Not Equal to Texas Findings
- **2005 SFIREG WQ List**
 - National Consensus List of 57 Pesticides of Interest
 - All are Present in Various Federal & State Lists
 - Baseline for Pesticides of Interest Assessment



2005 SFIREG LIST State POIs

2,4-D	Imidacloprid
Acetochlor (+ ESA, OXA)	Isoxaflutole
Alachlor (+ ESA)	Lambda-cyhalothrin
Aldicarb (+ degradates)	Lindane
Atrazine (+ DEA, DIA, DACT, Hydroxy)	Malathion
Azinphos-methyl	Mesotrione
Bentazon	Metalaxyl
Bromacil	Metsulfuron Methyl
Carbaryl	Metolachlor (+ ESA, OXA, S-Metolachlor)
Carbofuran	Metribuzin (+ DA, DADK, DK)
Chlorothalonil	MSMA + other arsenical herbicides
Chlorpyrifos	Napropamide
Clopyralid	Norflurazone (+ degradates)
Copper Pesticides	Pendimethalin
Cyanazine	Phenoxy herbicide group
Dacthal	Phosment
DBCP	Picloram
Diazinon	Prometon
Dicamba	Prometryn
Dieldrin	Propazine
Dimethenamid	Propiconazole
Diuron	Simazine (+ DACT, DIA)
Endosulfan	Sulfometuron (et. al.)
Esfenvalerate	TCP
Ethoprop	Tebuthiuron
Ethylene Dibromide	Terbacil
Glyphosate (+ AMPA)	Thiamethoxam
Hexazinone (+ Metabolite B)	Tralkoxydim
Imazamethabenz	Triallate
Imazapyr	Triclopyr
	Trifluralin



Pesticides of Interest

- **Texas Interagency Pesticide Database**
 - Compilation of GW Monitoring Data for State
 - >4700 Wells, >91,000 Analyte Entries
 - Lab & Immunoassay Results
 - Indicates Which Pesticides Most Often Detected
- **Data Gaps**
 - Urban Pesticide Monitoring Data Lacking
 - Limits Thorough POI Assessments
 - How to best Remedy the Gaps



Texas IPD Pesticide Detects

Confirmed Detects

Analyte	Number of Detections
Atrazine	81
Metolachlor	6
Prometon	6
2,4-D	5
Diazinon	3
Propazine	3
Simazine	3
Aroclor	2

All Detects

Analyte	Number of Detections
Atrazine	193
Diazinon	39
Prometon	34
Propazine	30
2,4-D	25
Triazine Met.	22
Simazine	22
Metolachlor	19
Bromacil	16



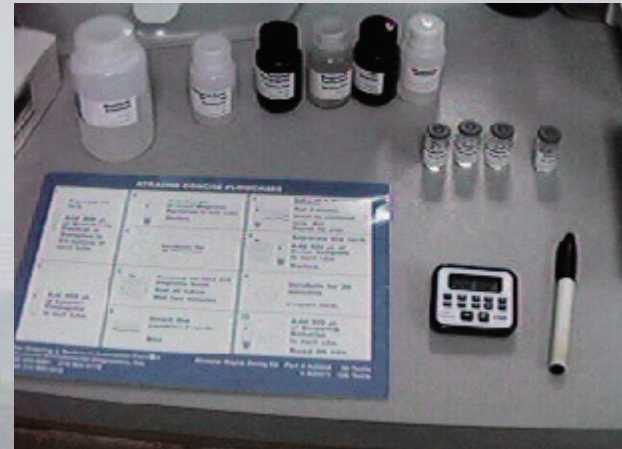
Groundwater Monitoring for Urban Pesticides

- **Immunoassay Kits**

- Available Kits & Cost
- New Instrument, Kits, and Learning Curve
- **Atrazine, Diazinon, Chlorpyrifos, Pyrethroids, & OP/Carbamate**
- Cost Limitations and Estimates



IMMUNOASSAY TESTING/SCREENING FOR PESTICIDES



Groundwater Monitoring for Urban Pesticides

- **Cooperative Monitoring**

- **Austin & San Antonio: Proximity, Wells, Cost**
- **Well Research and Field Reconnaissance**
- **Potential Federal, State, and Local Entities**
 - **EAA**
 - **BSEACD**
 - **SAWS**
 - **BMWD**
- **Coordination of Field Dates & Access**



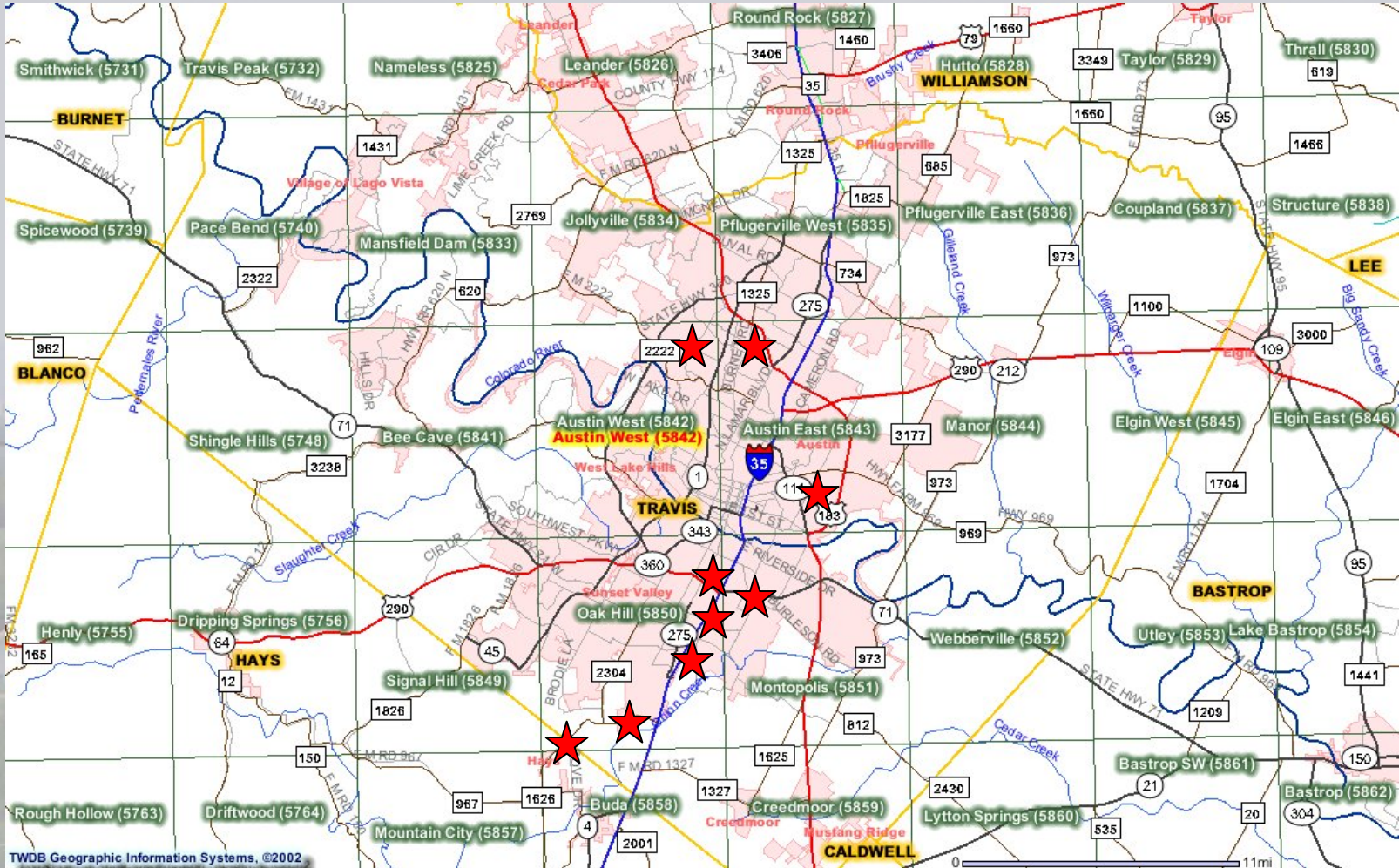
Sampling & Analytical Results

•Sampling

- 49 Wells Sampled, 4 Springs, & 7 Entry Points
- 22 Wells and 4 springs (Barton) in Austin
- 5 Pesticides, 298 Immunoassay Analyses
 - 68 Atrazine
 - 76 Diazinon
 - 87 Chlorpyrifos
 - 49 Pyrethroids
 - 18 OP/Carbamate



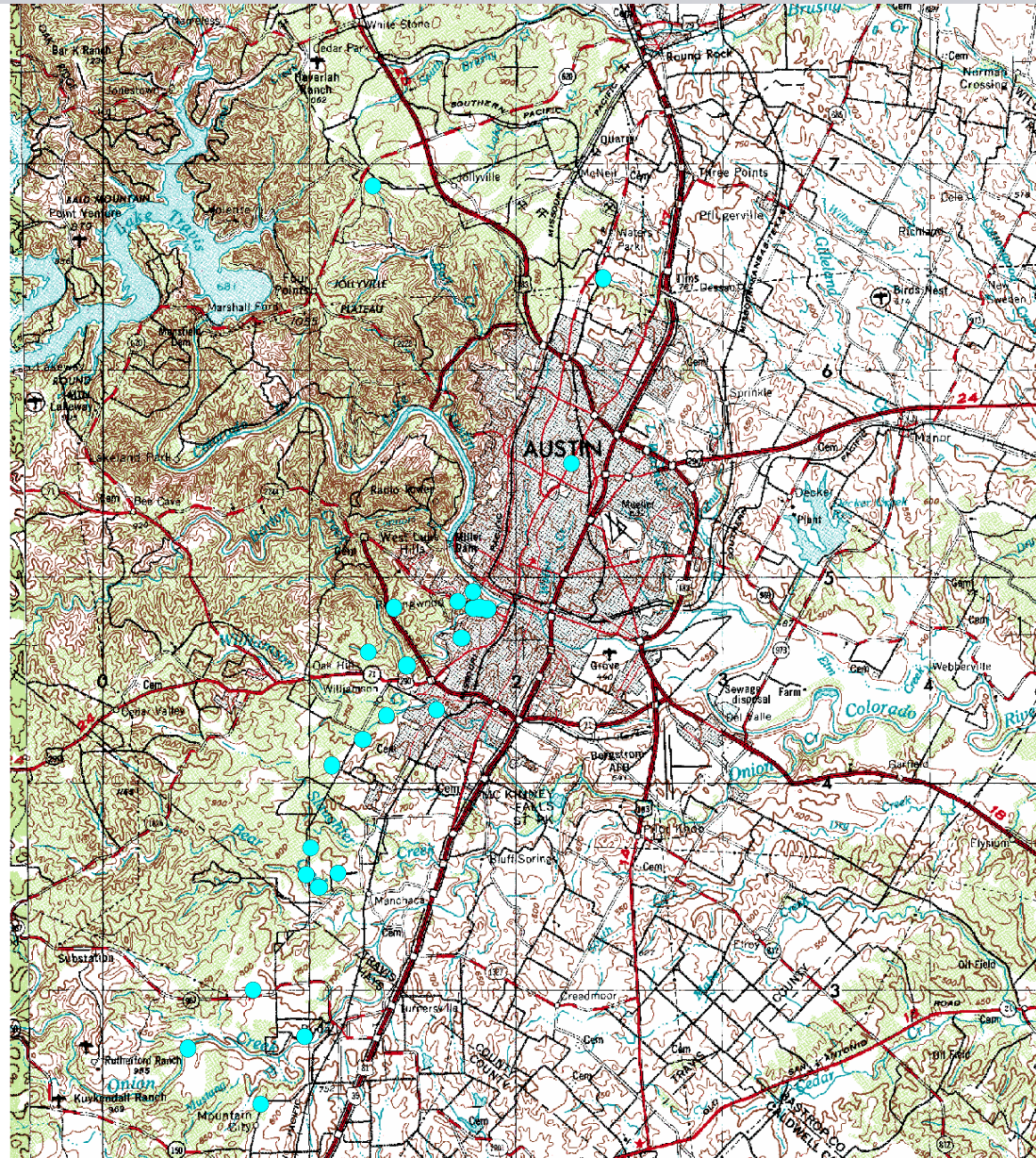
Austin Metro Sampling Areas



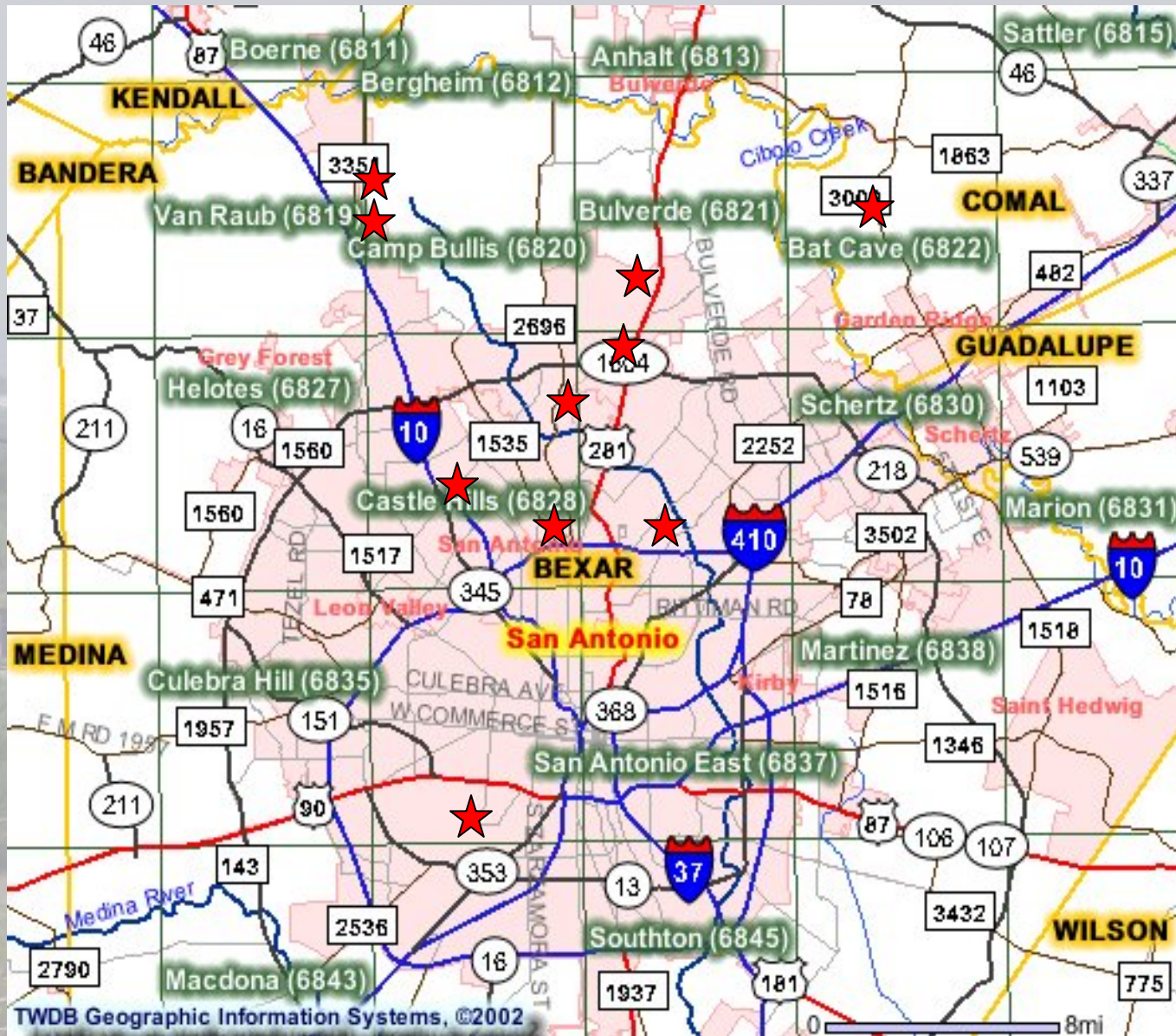
Barton Springs Sample Locations, Austin



Figure 2 – Austin Metro Sampling Areas



San Antonio Metro Sampling Areas





WP-1

Figure 1 – San Antonio Metro Sampling Areas



Sampling & Analytical Results

•Analytical Results

- 7 Atrazine Detects: High of 0.10 ppb
- 7 Diazinon Detects: High of 0.038 ppb
- 1 Chlorpyrifos Detect: High of 0.15 ppb
- No Pyrethroids Detects
- No OP/Carbamate Detects
- All Detects well below Action Levels



Conclusions & Recommendation

Conclusions

- Minor amounts of 3 pesticides detected
- Good Coverage in two metro areas overlying the Edwards & Trinity Aquifers
- Immunoassay & Cooperative Monitoring Approach efficient and effective for urban pesticide monitoring

Recommendations

- Continue Urban Pesticide Monitoring in 2008
- Resample wells with detects & possibly add additional wells in these areas
- Include a limited number of laboratory analyses for wells with detects



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Texas Groundwater Protection Committee
Agricultural Chemicals Subcommittee

<http://www.tgpc.state.tx.us/subcommittees/acs/acs.htm>

