

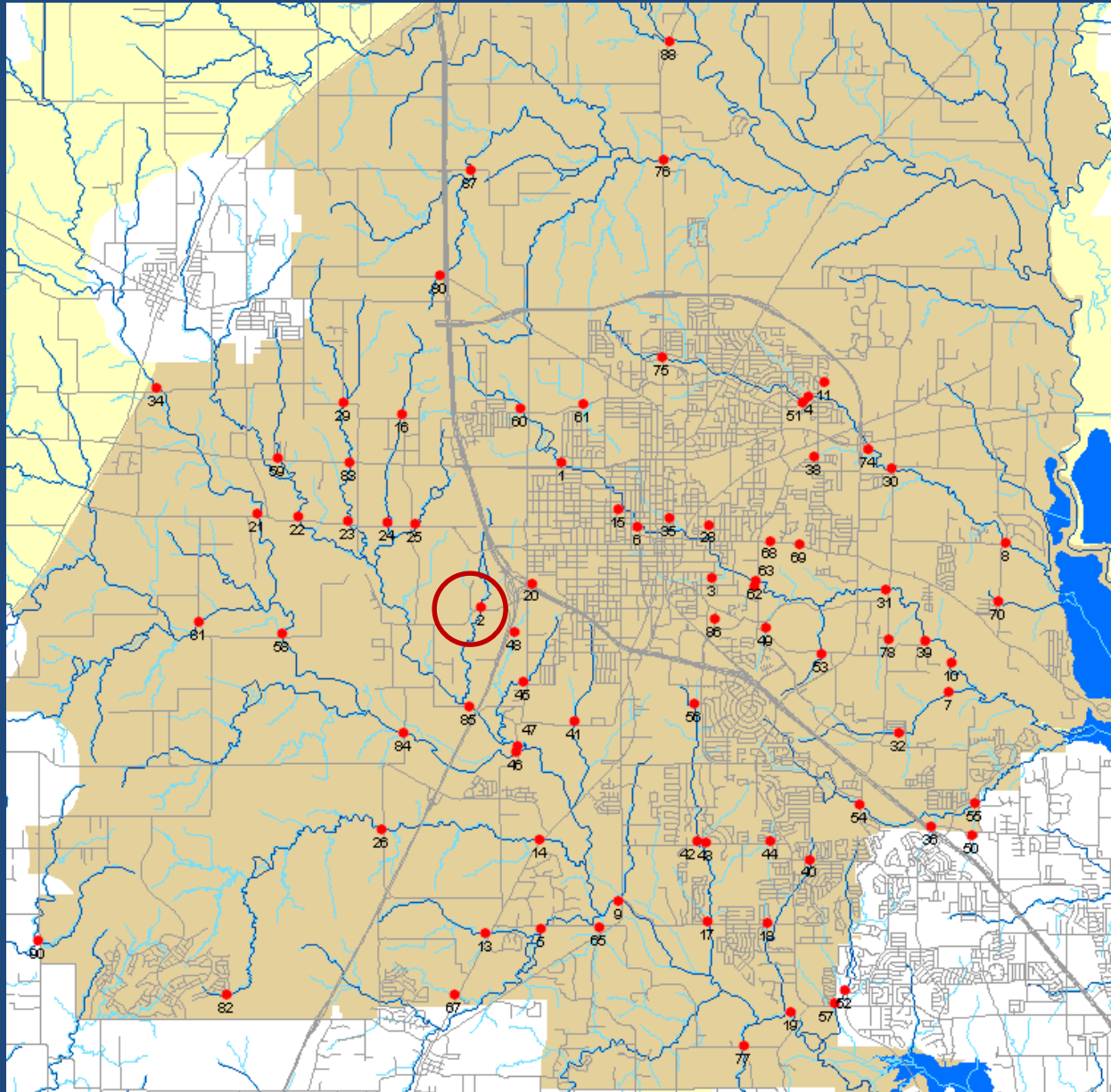
Dry Weather Screening to IDDE : A Gas Well Incident - Case study

Matthew Hendrix

City of Denton

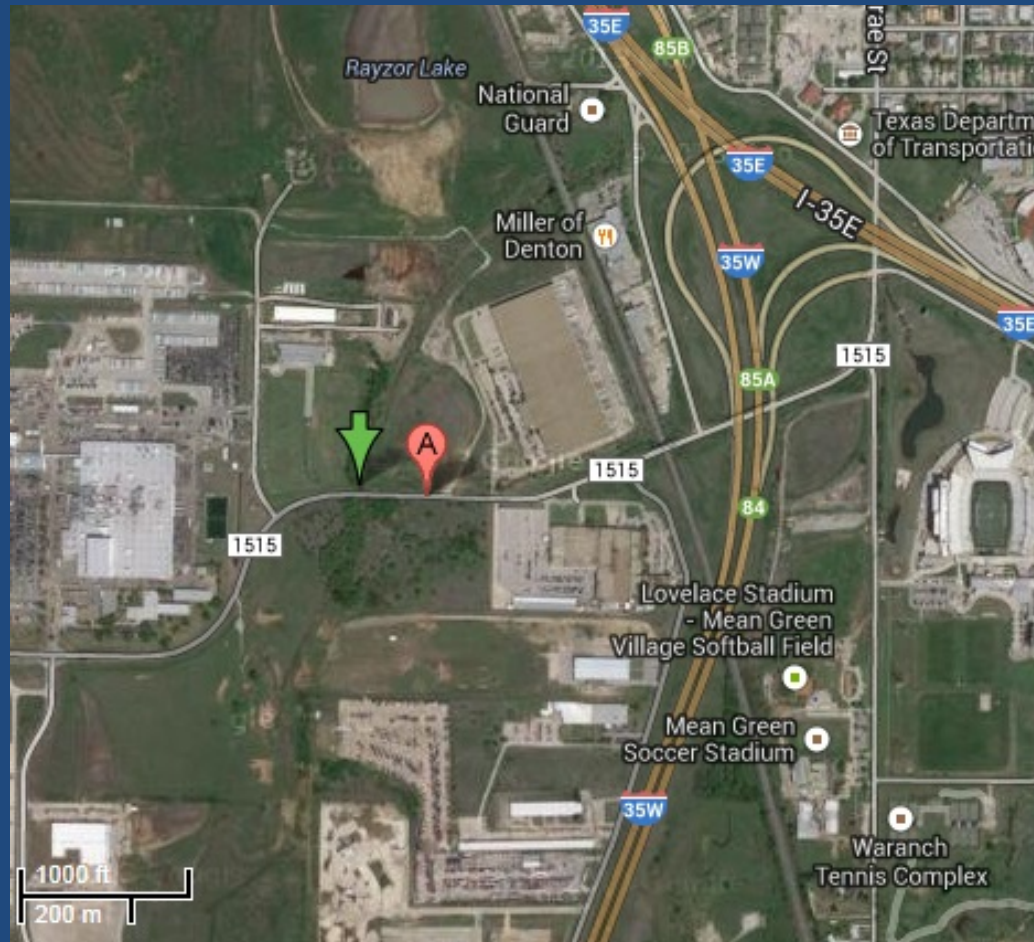
Watershed Protection

Denton DWS Map



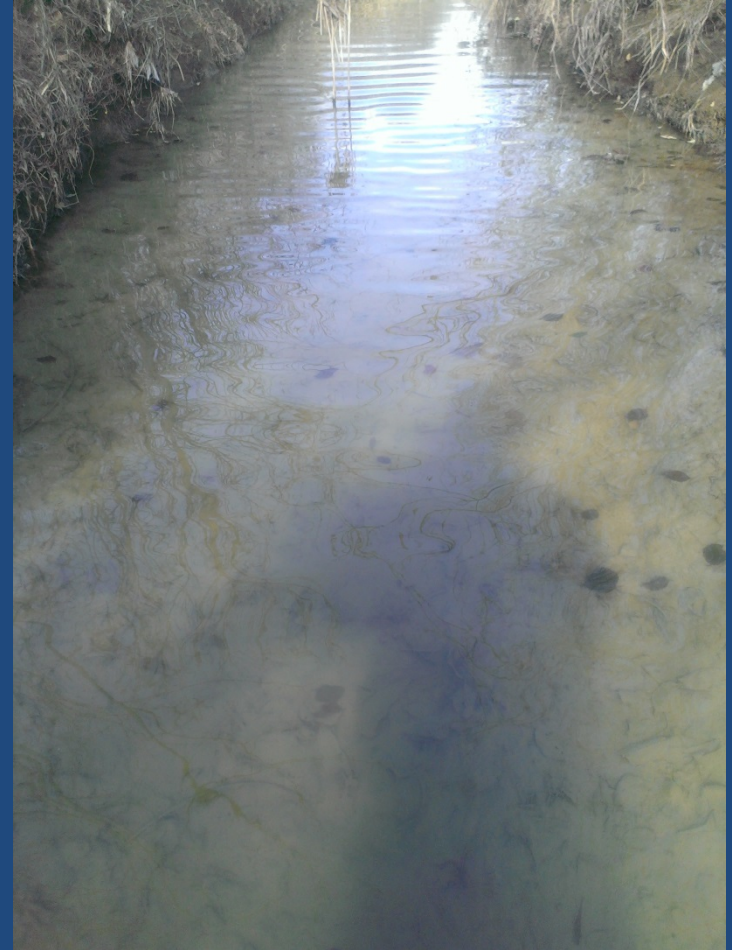
DWS January 2014

- Site 2: Airport Rd
 - Hickory Creek Tributary
 - Adjacent to Gas Well Pad Site
 - Small drainage area west of I-35
 - 4 businesses upstream, none of which have a stormwater permit
 - NECs



First Clues

- Odd odor, reminiscent of hydrocarbons but not discernible (to me)
- Unusual sheen with black, fibrous splotches
- Conductivity reading of **26,000 us/cm**



Min	25percentile	Average	Median	75percentile	Max	StDev	N	99th percentile
0.4	468	755.7741	652.65	912	17519	504.0053	7910	2325.82

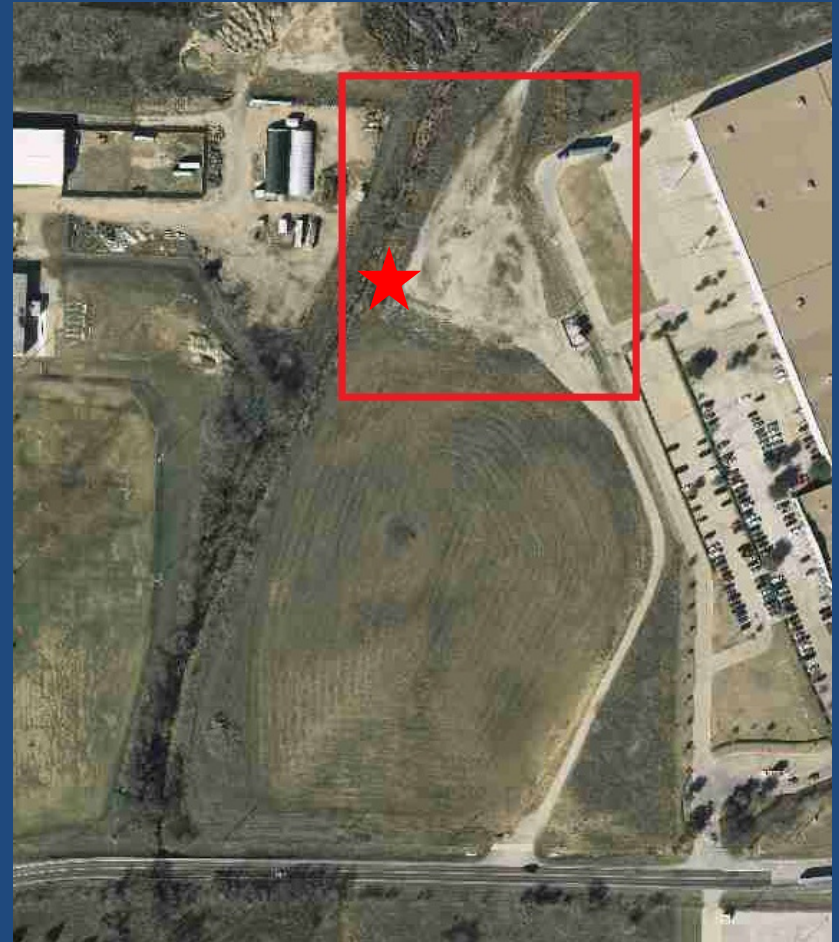
Further Upstream

- A small debris dam (rock and vegetation) holding back potential unknown IDDE material
- Grey and brown sludge backed up ~50 meters



Possible Source

- Gas Well Pad Site
 - Was actively being fracked at the time of incident
 - 2013 and 2015 aerials do not show the operation but **square** is pad-site
- Drilling Fluid was being stored on-site (**star**) mere yards from stream
 - Obvious discharge path under degraded BMPs (no pic, oops!)



Response Effort

- We Contacted:
 - Gas Well Inspections
 - RRC
 - TCEQ
- RRC contacted the Gas Well Company (who shall not be named...)
 - Their legal and bureaucratic machine stalled the investigation
- Same company claimed
 - no discharge had occurred
 - BMPs were adequate
- Denied our request for permission to sample soil/water on their property
- Eventually (**2 weeks later**) RRC was able to sample soil

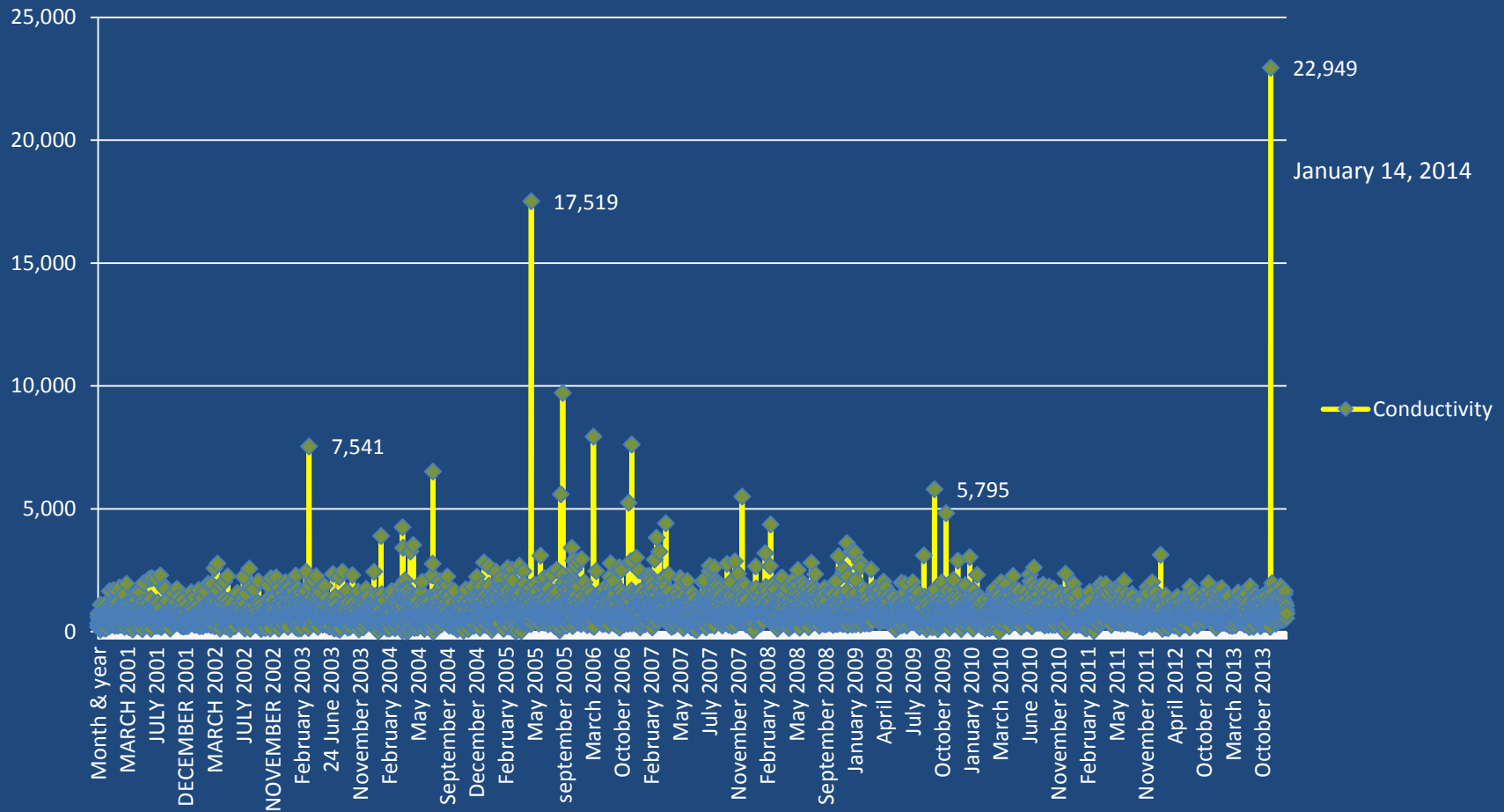
Building the Case

- Monitoring Information
 - ISCO auto sampler
 - Downstream of suspected discharge
 - Sonde Data (stars)
 - Upstream
 - Above Suspected Discharge
 - Pool Above Site 2 (ISCO)
- Grab Samples (stars)

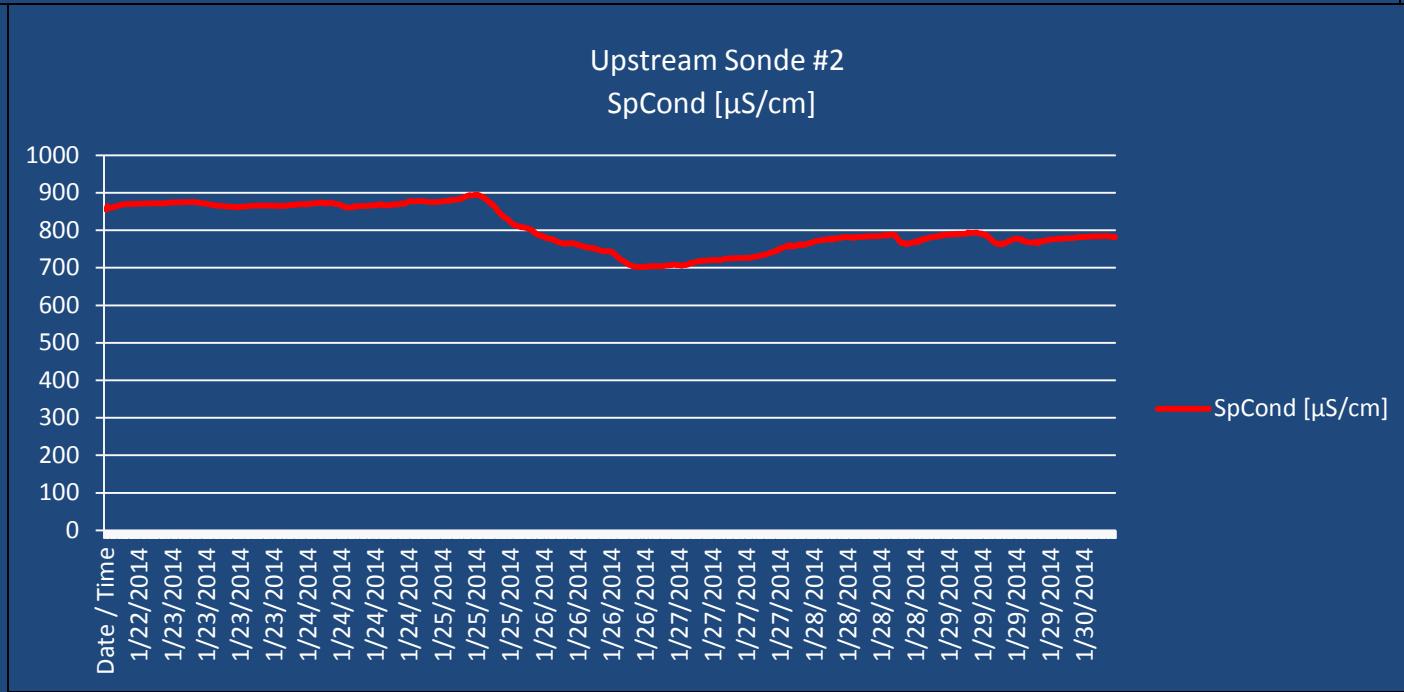
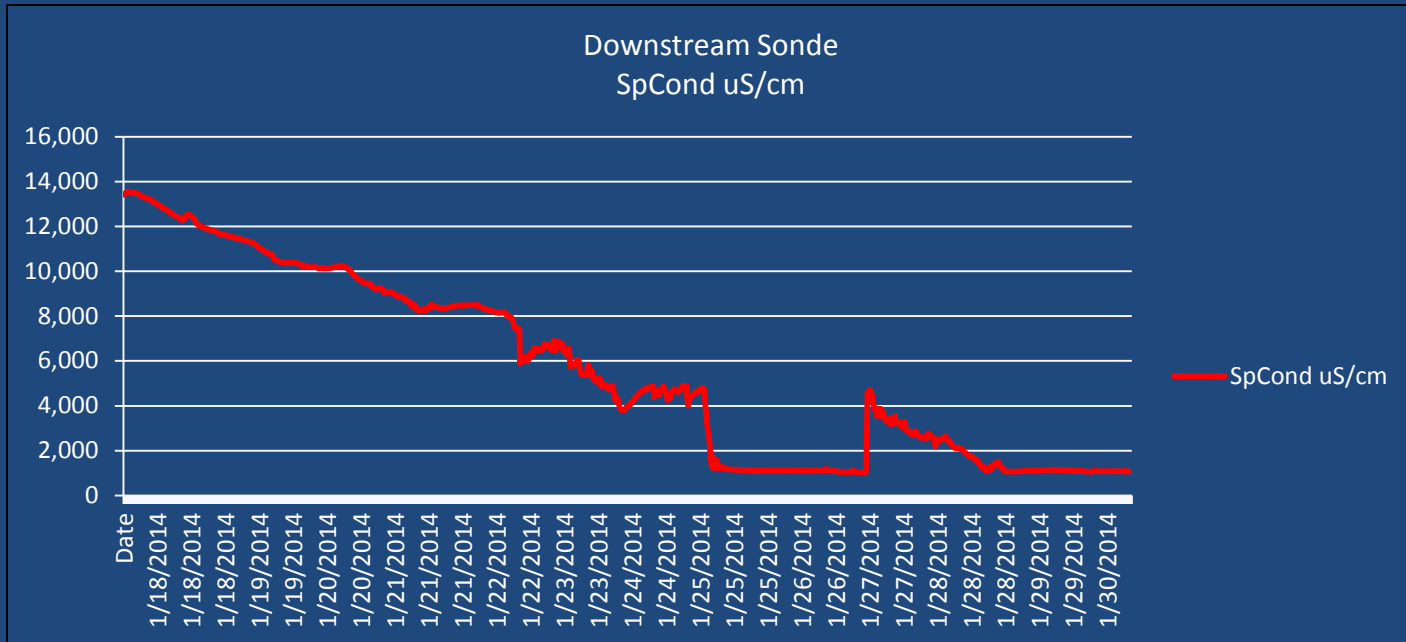
****Had to request permission from adjacent businesses and UNT to get these data****



Historic Conductivity in City of Denton



Results



Results

RRC Sampling (water) - 1/15/2014

<u>Analyte</u>	<u>Upstream</u>	<u>Downstream</u>
Chlorides	54	1050
Sodium	80	667
Potassium	<0.0043	4.35
Magnesium	0.994	7.89
Calcium	86.3	154.1

- Benzene: 0.0004mg/L
- Toluene: 0.0008mg/L
 - Both “below regulatory standards”
 - Indicating it was not an “oil field discharge”

RRC and Gas Well Co. Sampling

	<u>Analyte</u>	<u>Upstream</u>	<u>Downstream</u>
GWC	Chlorides (stream: 1/17)	300	800
RRC	Chlorides (1/29) (soil: ditch by frac tanks)	5020	27900
RRC	BTEX	Undetectable	Undetectable
COD	Chlorides (stream: 1/14)	102	18379

Conclusion(s)

- We determined something had occurred
 - Had data to back up this assertion
 - Gas Well Company Denied it to the end
 - Large degree of variability in results made our case difficult so legal did not pursue
- RRC confirmed there was something in the water that could have come from vicinity of storage tanks for proprietary drilling fluids

Conclusion

The operator was directed to:

- (1) Immediately remove all free-standing produced fluids from the ground surface.*
- (2) Repair or replace all leaking equipment and BMPs.*
- (3) Conduct excavation operations to vertically and horizontally delineate all areas affected by produced fluids.*
- (4) Initiate and complete remedial clean-up operations for all areas affected by produced fluids to promote aeration and natural remediation.*
- (5) Provide the District Office with a remedial plan and documentation that all cleanup operations are complete.*

(we never received a copy of this report)

End of the Story...?

