

“35+ Years in Project Research, Exploration, Evaluation, & Funding.”

Copeland Remote Sensing, LLC – Copeland Background and Capabilities

We have been involved in the petroleum industry since 1986. As a result of being successful we have had the good fortune to work with and be mentored by some outstanding managers, geologists, petroleum engineers, geophysicists, and petrophysicists. Over the past thirty years we have acquired a broad background in geology and petroleum engineering which enables us to analyze potential geological prospects for left behind production potential and profitability.

To date our largest project involved working with a geologist who had researched and developed a large Marcellus Shale prospect in West Virginia. We found a funding source and negotiated the contracts for the project which resulted in us receiving an overriding royalty in 220,000+ acres as well as a mineral ownership in 85,000+ acres. This was sold and used for R&D on our remote sensing technology.

Copeland Remote Sensing, LLC – We have always had an interest in remote sensing technologies for the petroleum industry and tried many of them. We have developed a *unique, proprietary, and proven oil and gas remote sensing technology* over the past eleven years which is used to quickly evaluate projects.

The HS System’s survey data was used to totally change the direction of a horizontal well which was very successful and spurred on the leasing of additional acreage on a project which was sold for a reported \$165,000,000.

Our **Hydrocarbon Surveys** technology, **US Patent granted Sept 1, 2020**, is also used to eliminate dry holes and very low producers, thus greatly improving the project bottom line, including re-completion and water floods.

Copeland Remote Sensing, Introduction and Field Case Studies:

1. The first two pages are system introduction sheets.
2. Page 3 is the RW Carter 4BH where the horizontal leg had been laid out but was totally reversed in order place it in a very high reading area from Hydrocarbon Surveys. Page 4 shows geological trends established by the HS survey, including an unknown cross fault. This well was extremely successful and spurred additional leasing and many more wells. It produced (page 5) 75,116 barrels of oil by production month nineteen and was still making 91 barrels per day.
3. Pages 6 & 7 show two examples of HS surveys in North Texas waterflood scenarios.
4. Page 8 is from a Kentucky survey with very good HS survey correlation on oil wells, a new gas field discovery, and a dry hole drilled in a low HS reading but a high radiometric reading location.
5. Page 9 shows the HS Model 2610 Unit with Mr. Copeland. The unit has a tight temperature control system and is housed in a Yeti cooler, talking to the laptop’s GIS and HS software packages via blue tooth. Readings are taken from inside a vehicle, boat, sled, etc.
6. Page 10 is an example of a HS unit in an ATV. With good terrain, we are able to take around 250 data point readings per unit day.

FIND OIL & GAS with Hydrocarbon Surveys (HS)!

HYDROCARBON SURVEYS'S SYSTEM OFFERS A NEW, POWERFUL AND INEXPENSIVE ENHANCEMENT TOOL FOR YOUR GEOLOGICAL & GEOPHYSICAL LINEUP

HS SYSTEM WILL:

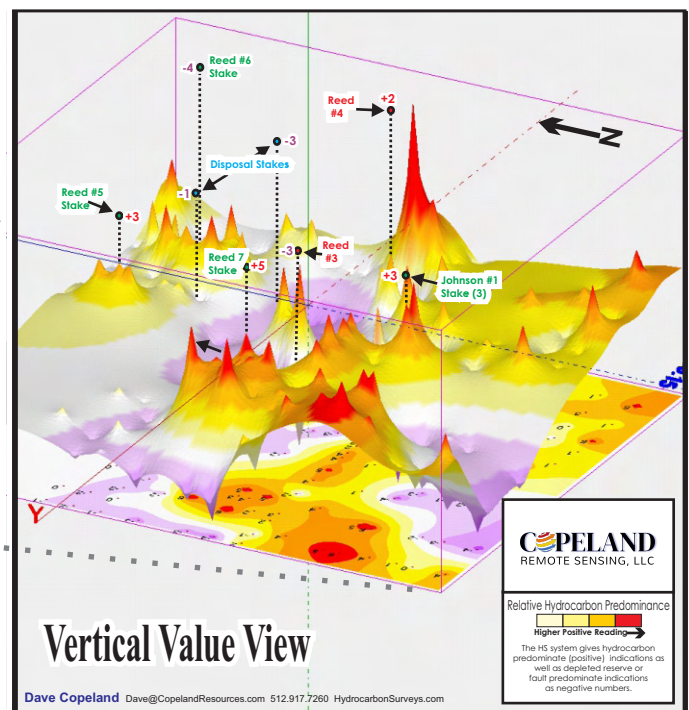
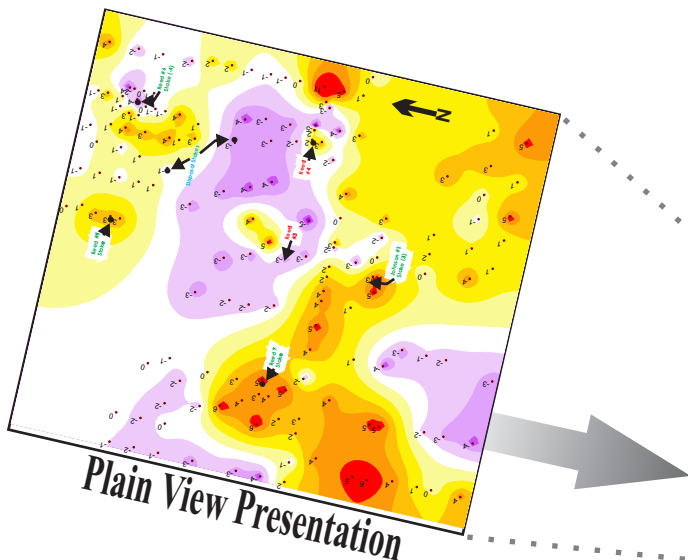
1. FIND HYDROCARBONS BELOW THE POINT OF MEASUREMENT.
2. FIND LATERAL EXTENT OF RESERVOIRS.
3. GIVE A RELATIVE STRENGTH READING FOR TOTAL RESERVOIR DENSITY.
4. GIVE A DISTINCT READING FOR NON-HYDROCARBON BEARING FAULTS.

HS SYSTEM WILL NOT:

TELL HOW MANY PRODUCING ZONES OR FAULTS, HOW DEEP THEY ARE, OR MEASURE FINITE AMOUNTS OF FLUIDS IN PLACE (BO & MCFG).

The preference is to run a grid pattern with the HS monitoring system. A color coded relative value map is presented after the data is processed. In some cases the client procures a "Vertical Value View Presentation" as to the right. This visualization tool gives a clearer idea of the

relative values. HS's staff can work with the geological team to correlate the HS data with data from other sources. Data presentations can be overlaid on topographical, geological, etc. maps. This example is from a low density pattern.



OUR SYSTEM UTILIZES A SPECIALIZED HYDROCARBON MONITORING SENSOR.

Copeland Remote Sensing takes individual point measurements (requiring app. three minutes per point). Measurements can be taken over land or water and are not effected by most roadways or other surface materials.

As readings are taken, the pattern and density for future readings can be adjusted on the fly to give greater detail to areas of interest. HS's real-time data acquisition versatility adds to its being a cost and time effective tool.

Data interpretation, mapping & presentation have a short turn around time and can supplied in formats that can be imported by most mapping software.

See HS APPLICATION SHEETS & COPELANDREMOTESENSING.COM for additional information.

PATENT PENDING

COPELAND
REMOTE SENSING, LLC

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Copeland Remote Sensing SYSTEM INTRODUCTION – PATENT APPROVED

Hydrocarbon Surveys (CopelandRemoteSensing.com) technology was developed by C. David Copeland of Austin, Texas. Prior to entering the petroleum industry in 1986, Copeland worked in broadcast engineering, servicing and inventing industrial electronics and robotics products and systems. Over the past twenty years, he has investigated a number of remote sensing technologies (Including a NASA research grant.) in the oil and gas industry and established associations with many talented and knowledgeable individuals in the field.

Research and development together with countless field trials resulted in a working integrated system that delivers relative readings for net cumulative hydrocarbons below points being measured as well as fault indications.

Copeland and several engineering associates are in the process of taking the system to the new levels of field application development broadening and expediting data acquisition capabilities.

CRS SYSTEM WILL:

1. Find hydrocarbons below the point of measurement.
2. Help establish lateral extent of reservoirs.
3. Give relative strength readings for total reservoir density.
4. Give a distinct reading for non-hydrocarbon bearing faults.
5. Gives an indication of gas or gassy zones versus oil-only zones.
6. Is very pin pointed in the cone of influence below the point of measurement.
7. Provides geocoded mapping that can be integrated in layers with client geology.
8. Map presentation capability in several formats to accommodate different needs.

CRS SYSTEM WILL NOT:

1. Tell how many zones or faults are below the point of measurement.
2. Measure depth of zones or faults.
3. Measure finite amounts of fluids in place.

This system, as well as all data sources, is most valuable when correlated with other geological and geophysical data to develop a picture of hydrocarbons in place.

It is important to know that this system, other than finding faults, does not see structures but rather identifies actual hydrocarbons in place, real time, directly below the point of measurement. It is a receiver that measures the effect that fluid hydrocarbons in a reservoir and faulting have on a certain signal. Hydrocarbons have a positive effect and faulting has a negative effect. In cases where a fault trapped reservoir is encountered, the hydrocarbon predominant effect is somewhat dampened in the area of the fault.

Data output presentation examples can be seen on the associated Hydrocarbon Surveys General Introduction sheet and on our web site. Our GIS personnel work with client geological, geophysical, and operational staff to deliver products to fit specific requirements.

RW CARTER HYDROCARBON SURVEY POINTS OF INTEREST

Two pay zone HS survey scenarios

Introduction: Subject well – RW Carter 4BH, 42-055-34885, Texas RRC lease #14965, IP test May 14, 2008. It was drilled horizontally in the Edwards zone, which is some 350 ft below the existing Austin Chalk producing zone to tap the strong water drive Edwards. The initial production (IP) of the well was **flowing up the 7” casing, 284 bopd & 6,188 bwpd which is a 4.6% oil cut.**

A medium resolution Hydrocarbon Surveys survey was run on the entire lease which revealed a high area around the 1B location. It showed a much higher area to near the southwest side of the lease. The HS data value code is shown on the left side of the Carter illustration. A vertical value presentation of the HS survey is also included.

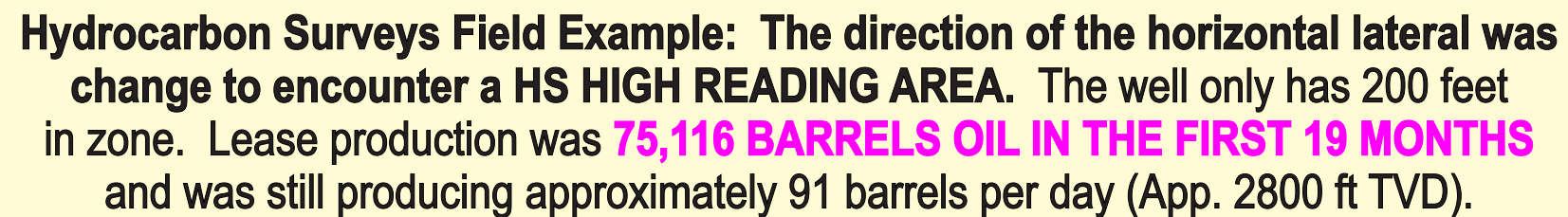
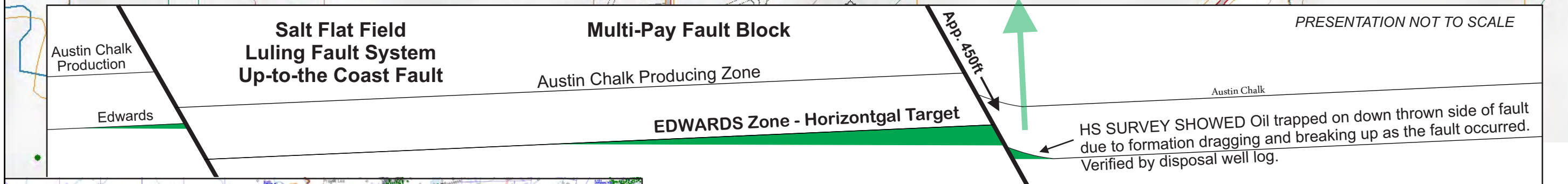
To determine the best member of the Upper Edwards to drill the lateral in, 4 vertical wells were drilled straddling the path of the proposed 1,000 ft lateral. These wells were logged with high resolution, 20-inch logs through the Edwards. The log on the #1B well showed higher potential than the other 3 wells. Given the correlation between the HS readings around the #1B and the well logs, the operator reversed the direction of the lateral, to the southwest and made a VERY SUCCESSFUL WELL. It produced some **75,116 bo in the first 19 months, still making 91 bopd**, before another well was added to the lease.

Hydrocarbon Surveys Points of Interest

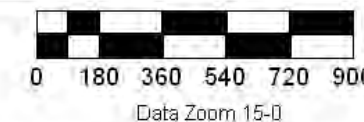
1. This is a **two-pay zone scenario** with the horizontal, Edwards, being below the existing Austin Chalk formation. The total vertical depth (TVD) of the Edwards is only 2,800 feet.
2. The play is based on a large, 450 ft, fault which traps the Edwards up against shales. This fault was shown by the HS system, as well as another known fault, down-dip to the east. HS survey data indicated an UNKNOWN CROSS FAULT.
3. Additionally, HS data indicates a small oil reservoir on the down-thrown side of the main fault which was caused by a dragging effect (see diagram). This is not the case on the lesser fault to the east.
4. A few years later HS road surveys along a road on the north side of lease showed lower HS readings, which confirms drainage by the horizontal wells.



HYDROCARBON SURVEYS
US PATENT #US 10,761,237 B1

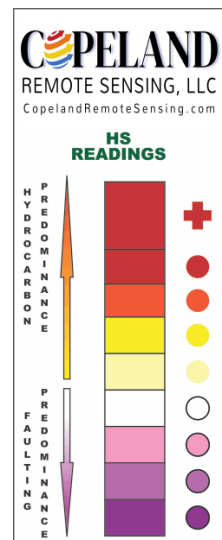


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Hydrocarbon Surveys SUCCESS

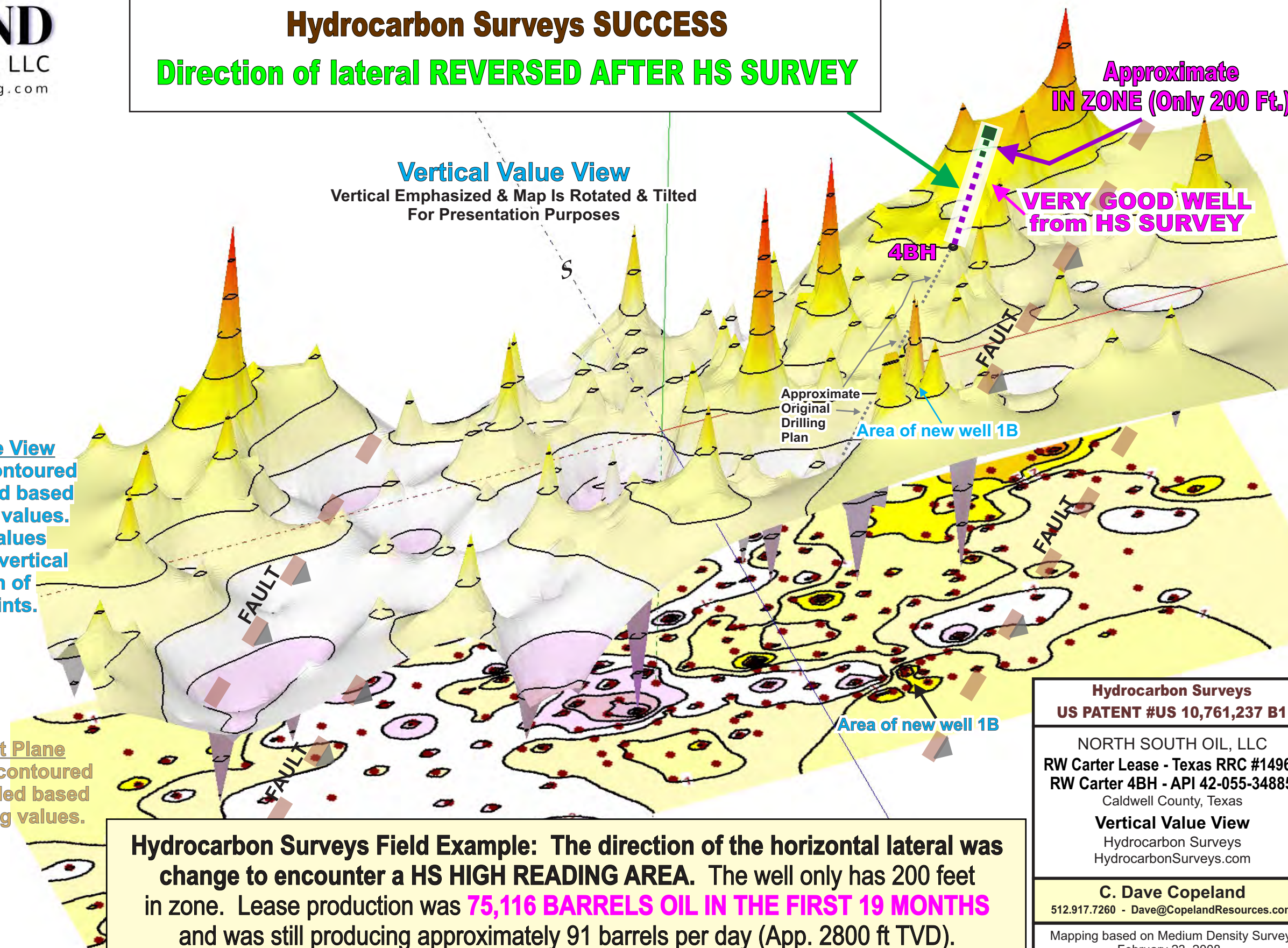
Direction of lateral REVERSED AFTER HS SURVEY



Vertical Value View
This plane is contoured and color coded based on HS reading values. ALSO, HS Values determine the vertical disposition of HS data points.

Normal Flat Plane
This plane is contoured and color coded based on HS reading values.

Vertical Value View
Vertical Emphasized & Map Is Rotated & Tilted For Presentation Purposes



Hydrocarbon Surveys Field Example: The direction of the horizontal lateral was change to encounter a HS HIGH READING AREA. The well only has 200 feet in zone. Lease production was **75,116 BARRELS OIL IN THE FIRST 19 MONTHS** and was still producing approximately 91 barrels per day (App. 2800 ft TVD).

Hydrocarbon Surveys
US PATENT #US 10,761,237 B1

NORTH SOUTH OIL, LLC
RW Carter Lease - Texas RRC #14965
RW Carter 4BH - API 42-055-34885
Caldwell County, Texas

Vertical Value View
Hydrocarbon Surveys
HydrocarbonSurveys.com

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Mapping based on Medium Density Survey
February 23, 2008.

HYDROCARBON SURVEYS
a Unique Patented Technology for
FINDING OIL & GAS Reserves
US PATENT # US 10,761,237 B1
Issued Sep. 1, 2020

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Production Hub Pages

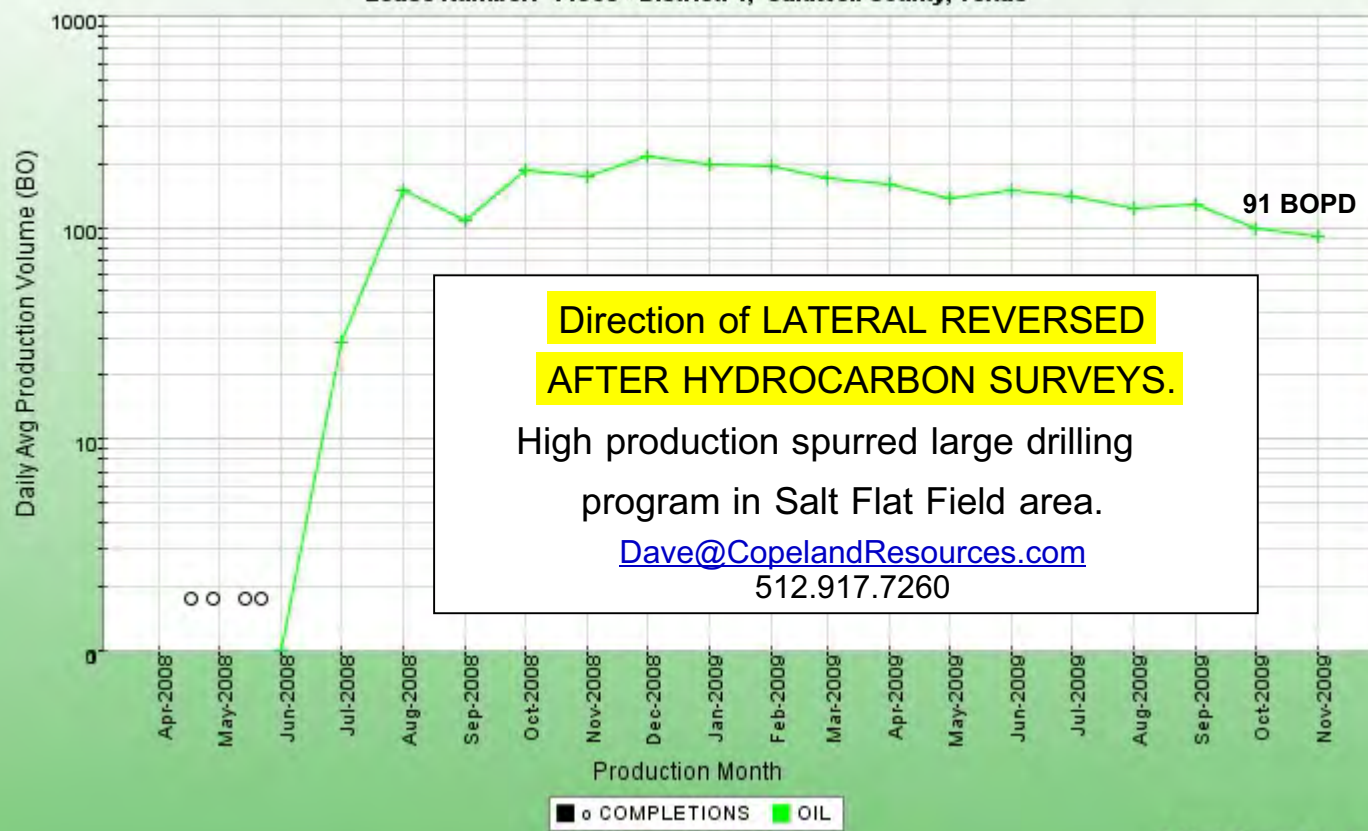


**RW Carter #4BH – Only 200 foot lateral in Edwards –
Location selected from Copeland Remote Sensing, LLC high reading show.**

Field SALT FLAT (EDWARDS)	Operator NORTH SOUTH OIL, LLC	Location District: 1; Caldwell County, Texas
Lease Name CARTER, R. W.	Oil Lease Number 14965	Cumulative (since 2008) 75,116 BO
Wells		
42-055-34882(1BH) 42-055-34883(2B) 42-055-34884(3B)		42-055-34885(4BH)
42-055-34909(5BH) 42-055-34910(6BH)		(1BH, 5BH, & 6BH not on line yet.)

Oil Production

Daily Avg Production Volume (Logarithmic) vs. Time
Lease Number: 14965 - District: 1; Caldwell County, Texas



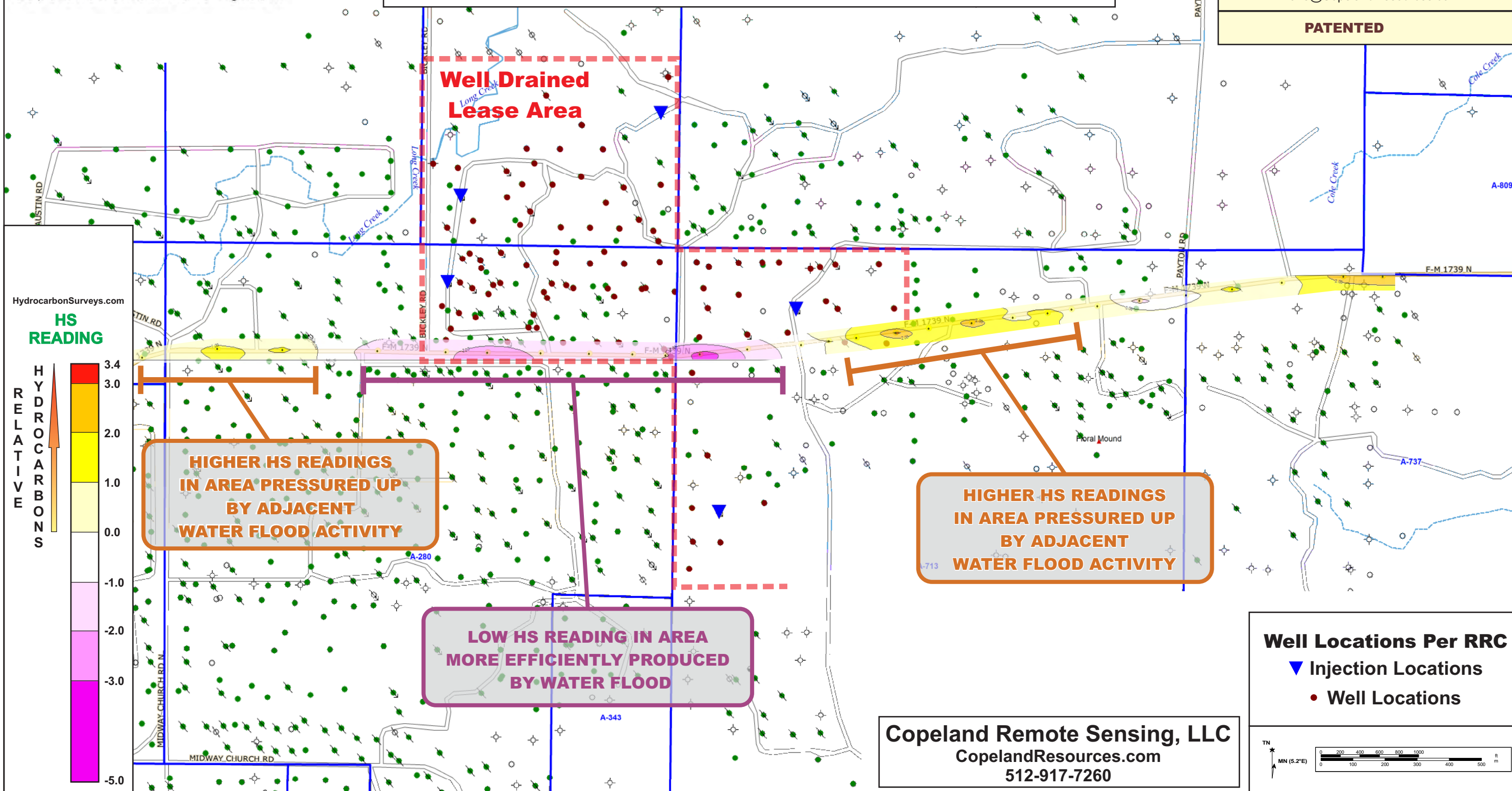
© 2010 DrillingInfo, Inc.

**LOW HYDROCARBON READING AREA ASSOCIATED
WITH A MORE EFFICIENTLY DRAINED AREA.
HS READINGS ARE - REAL TIME FOR OIL IN PLACE!
POWERFUL WATER FLOOD DESIGN TOOL!!**

WATER FLOOD LEASE STUDY
North Texas
Hydrocarbon Road Survey

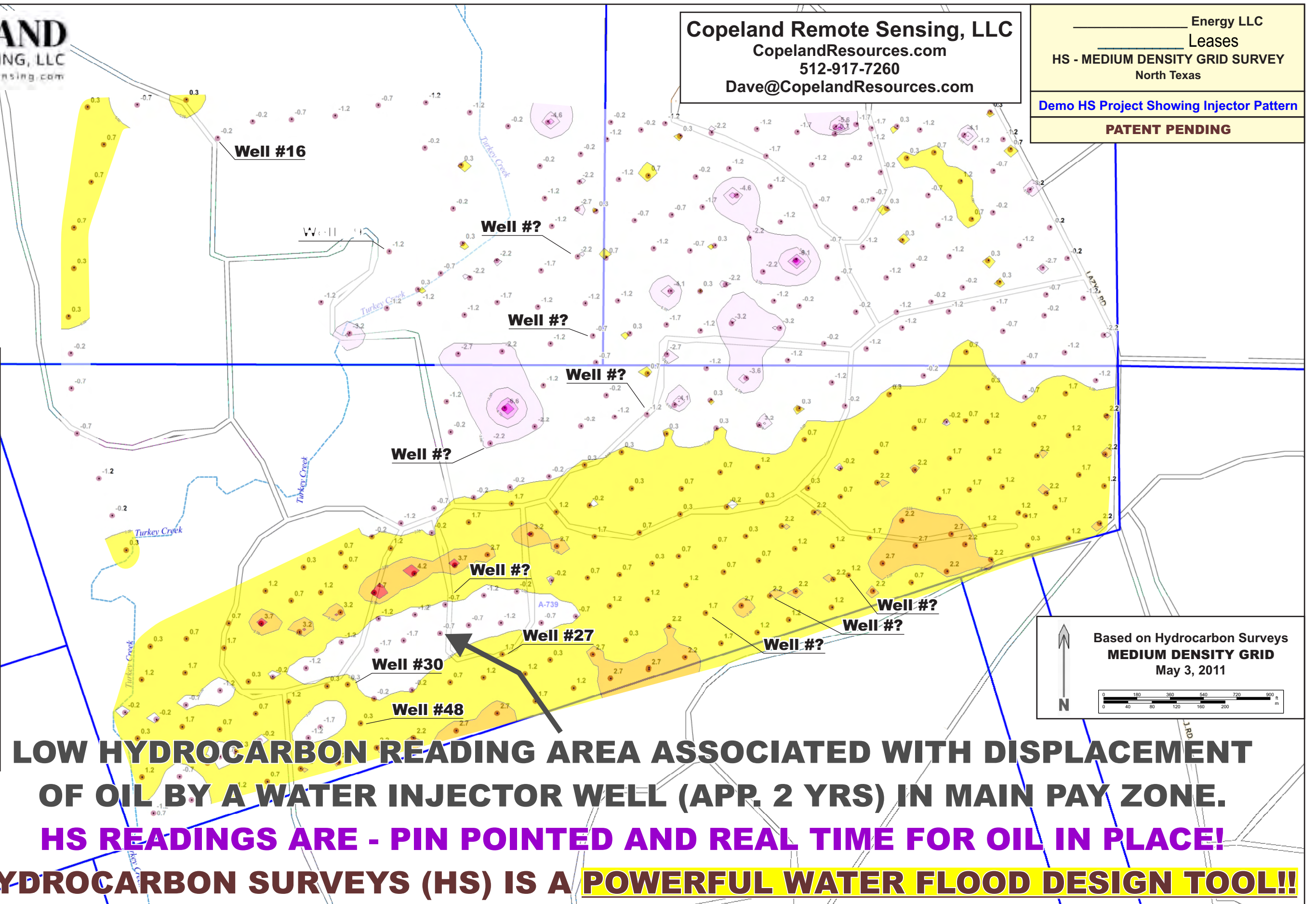
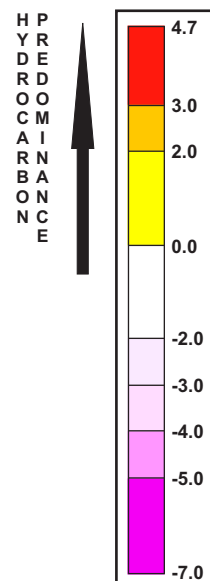
Hydrocarbon Survey : May 2011
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PATENTED



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Well Locations Per RRC
▼ Injection Locations
• Well Locations



**LOW HYDROCARBON READING AREA ASSOCIATED WITH DISPLACEMENT
OF OIL BY A WATER INJECTOR WELL (APP. 2 YRS) IN MAIN PAY ZONE.**

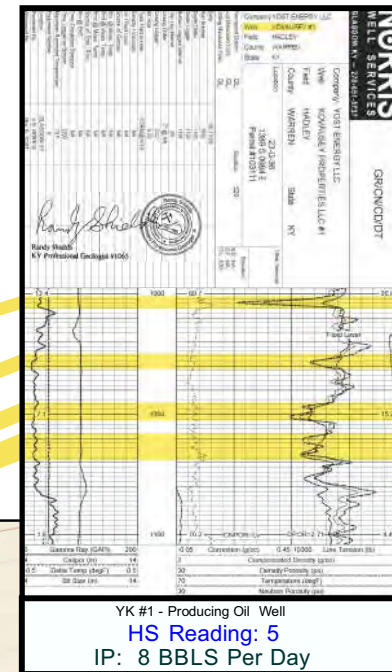
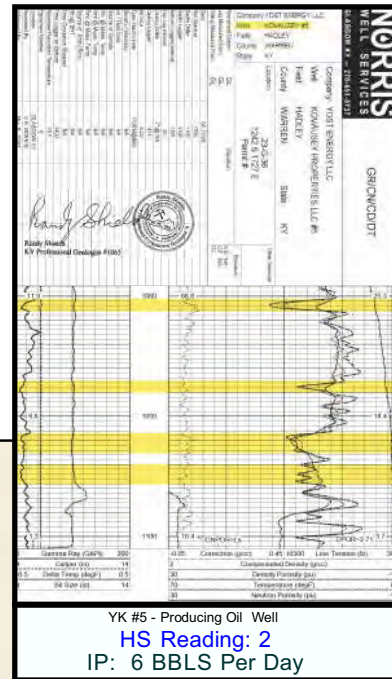
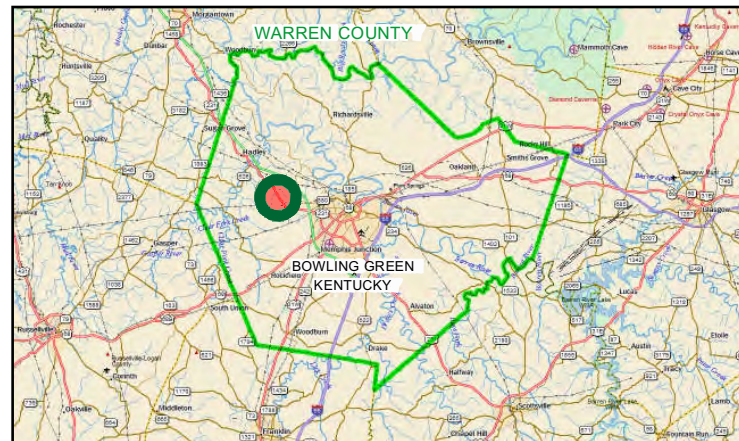
HS READINGS ARE - PIN POINTED AND REAL TIME FOR OIL IN PLACE!

HYDROCARBON SURVEYS (HS) IS A POWERFUL WATER FLOOD DESIGN TOOL!!

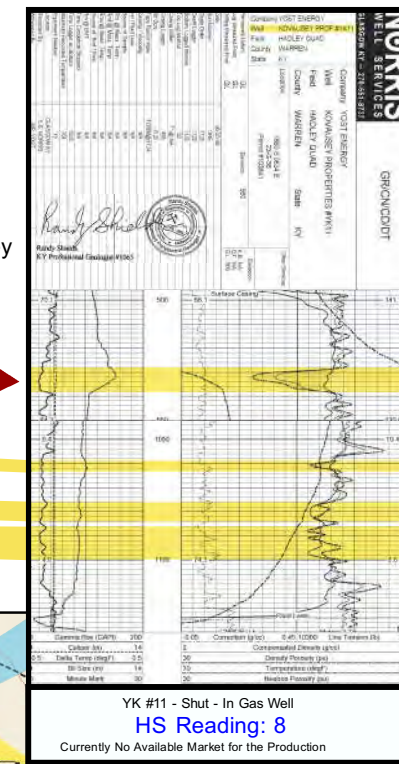
FINDING OIL & GAS WITH “HYDROCARBON SURVEYS”

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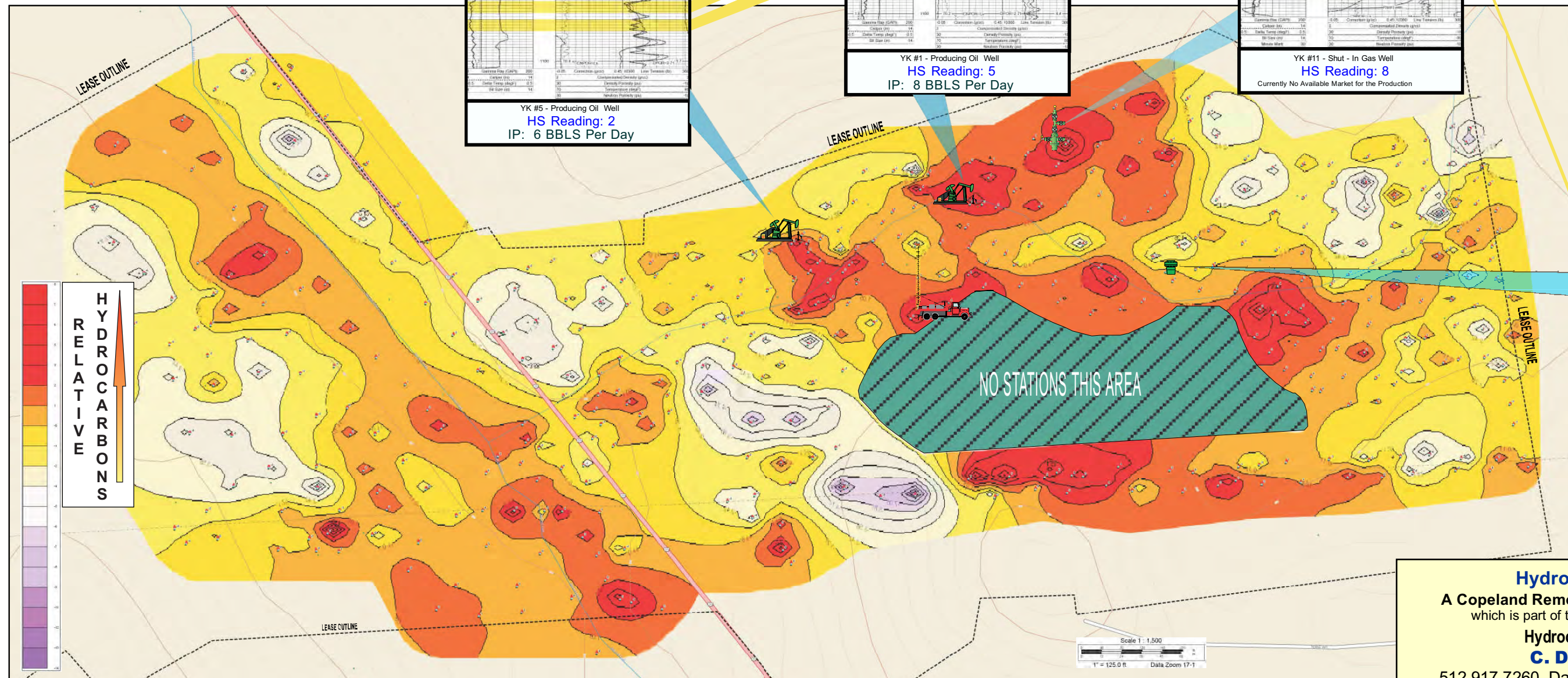
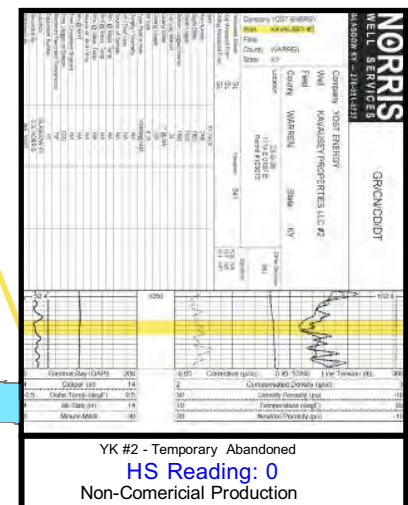
Field Application Study - Lowe Lease, Warren County, KY



High Hydrocarbon Survey
reading leads to
**NEW GAS FIELD
DISCOVERY**



RESULTS LOWE LEASE STUDY
YK 5 - HS reading of 2, **IP 6 BOPD**
YK 1 - HS reading of 5, **IP 8 BOPD**
YK 11 - HS reading of 8, **New GAS FIELD**
YK 2 - HS reading of 0, **DRY HOLE**
Yk 2 was drilled to test HS system negative validity.
Yk 2 was on the best location
according to radiometric readings.
US PATENT 10,761,237 B1
Issued Sept. 1, 2020

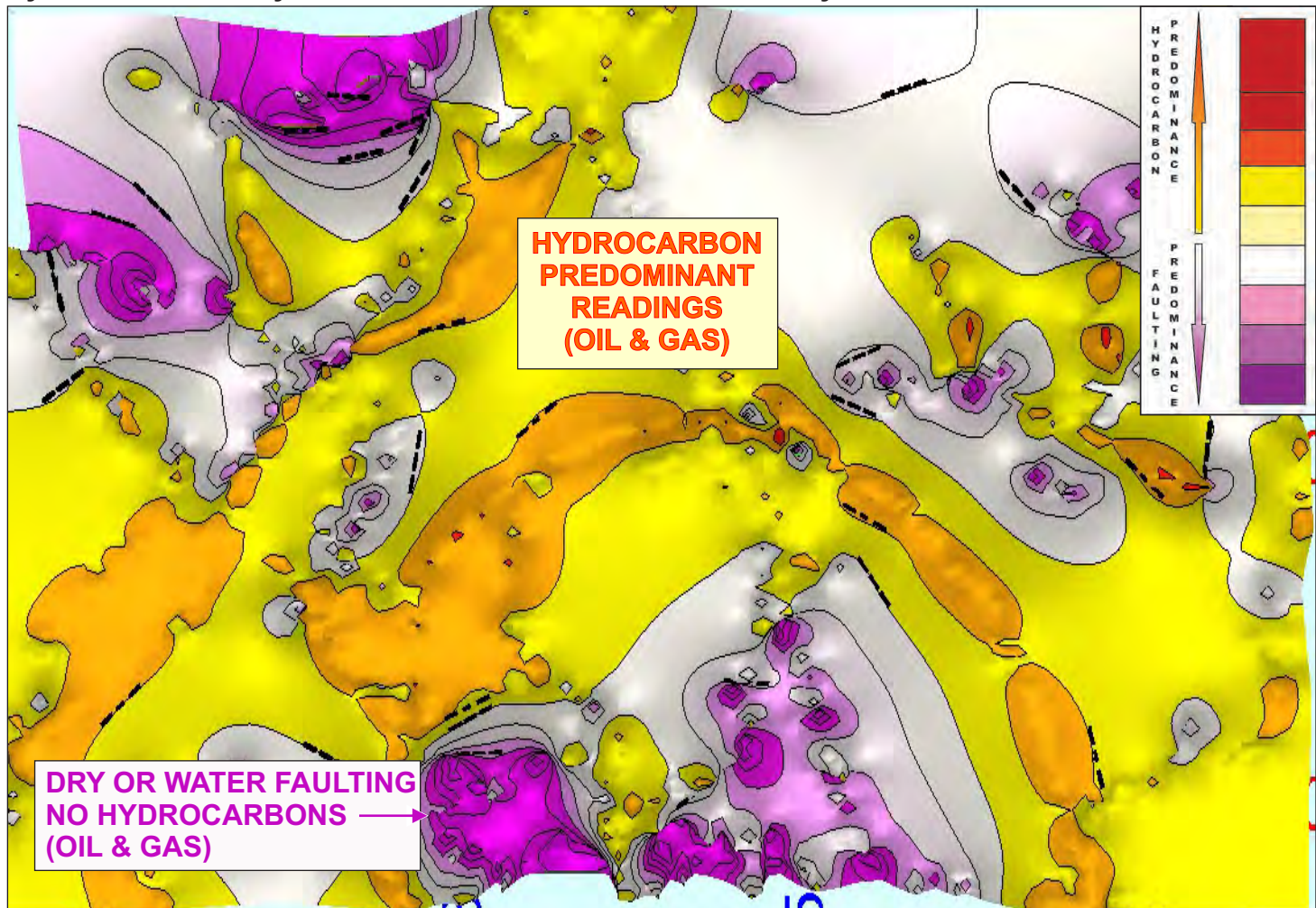


Hydrocarbon Surveys
A Copeland Remote Sensing, LLC Technology
which is part of the Copeland companies group.
HydrocarbonSurveys.com
C. Dave Copeland
512.917.7260 Dave@CopelandResources.com

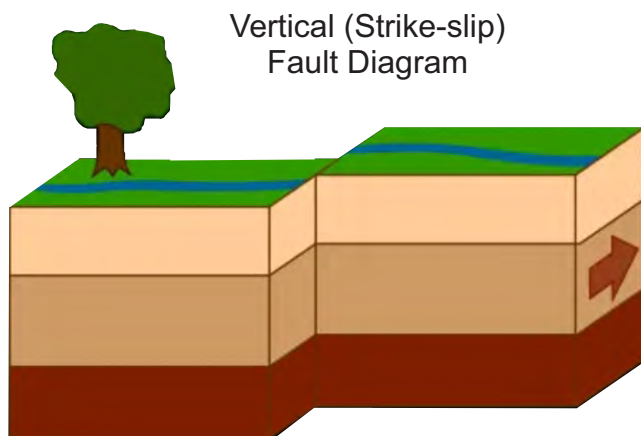
Finding VERTICAL FAULTS with Hydrocarbon Surveys (HS)

1. HS system is very effective at locating vertical (slip-strike) faults.
2. It can determine if they are hydrocarbon bearing and the best place to drill wells, as well as where not to drill.
3. For building construction planning, HS can point out potential unstable areas associated with the vertical, slip-strike faults.

Hydrocarbon Surveys - Vertical Value View of an area surveyed in Texas.



PATENT US 10,761,237 B1 Sep. 1, 2020



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CopelandResources.com

See additional sheets for system capabilities and design.

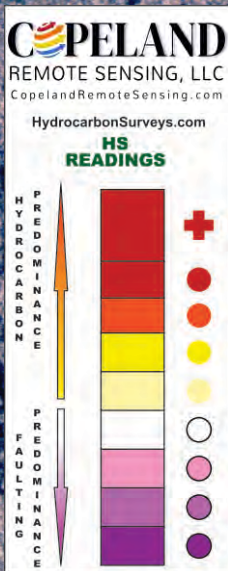
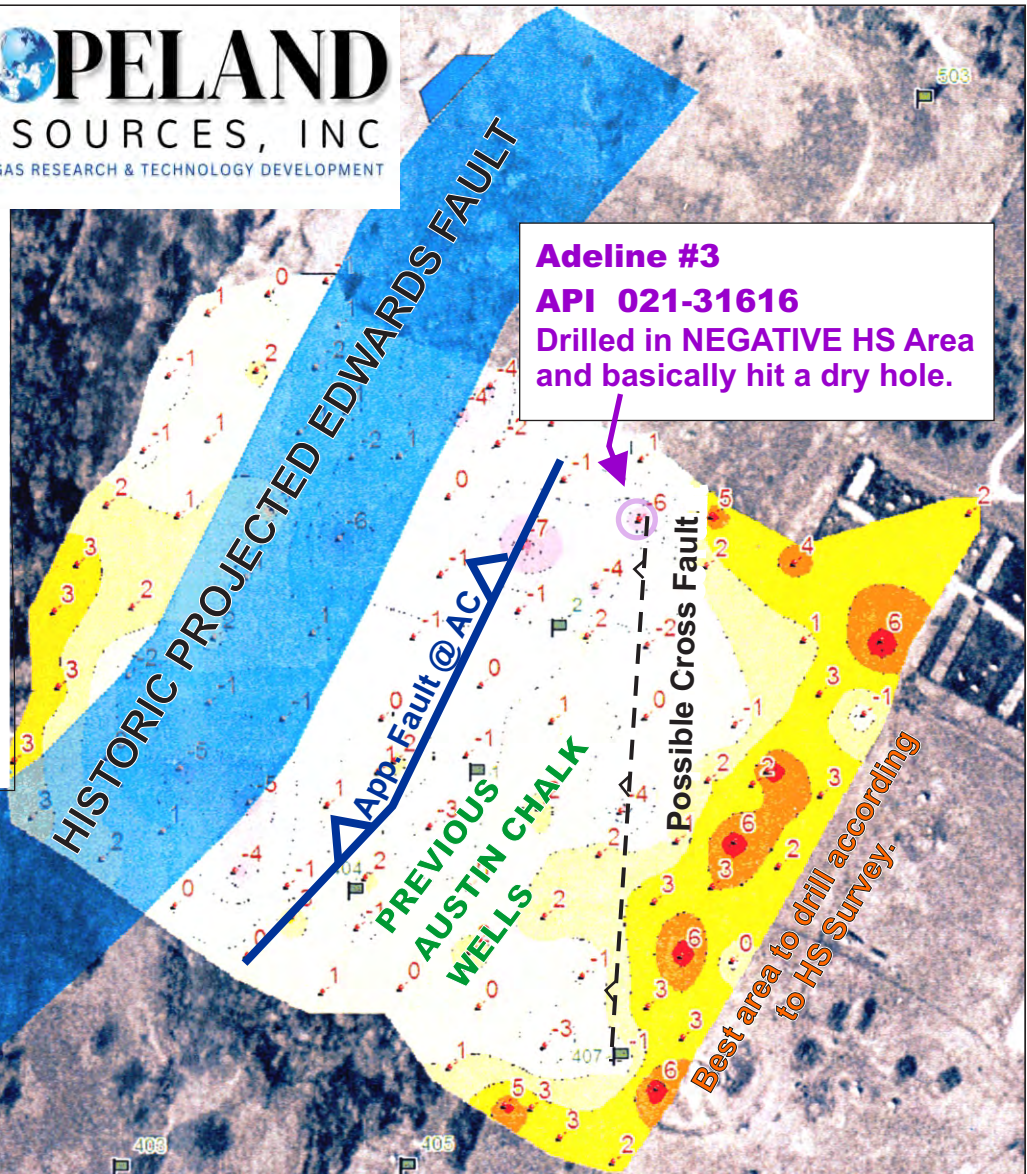
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Hydrocarbon Surveys (HS) - "Do NOT drill here!!!"



Example of operator who went against the HS survey data and drilled a well up near the Austin Chalk fault because everybody knows that it is where you get the best fractures. *A study of the HS map shows they probably drilled on the down-thrown side of a cross fault which was found by the HS survey.*

While drilling, he bragged to the mud loggers that Copeland's system can't be right. At TD they told the operator that it was a dry hole but he completed the promoted well anyway.



Adeline #3 was drilled in line with previous wells in order to catch the same fault trap as they did, even though the HS readings showed it to be a negative area.

This was a promoted well and they completed it even though the mud log and e-log had poor shows. It did not produce enough to pay for the completion costs.

Later analysis of the HS results revealed a possible cross fault which would have isolated that area.

HYDROCARBON SURVEYS CAN KEEP YOU FROM DRILLING OR RE-COMPLETING BAD WELLS.

Hydrocarbon Surveys
indicated **DO NOT DRILL**
A WELL HERE!

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Adeline #3
021-31616

Initial Production
Adeline Lease Started
in January 1995.

•²₃₁₄₉₇
•²₃₁₄₉₇

Completed Oct. 2010
2,170'-2,200' Dale Lime

•¹₃₁₄₉₆

United States PATENT
US 10,761,237 B1
Issued Sep. 1, 2020

Hydrocarbon Surveys is good for
picking optimal locations to drill
and indicating where you should
NOT drill. **THIS OPERATOR**
CHOSE TO GO AGAINST OUR
HS READINGS AND DRILLED &
COMPLETED A WELL THAT DID
NOT EVEN PAY FOR COMPLETION!

HydrocarbonSurveys.com

C. Dave Copeland

512.917.7260 Dave@CopelandResources.com

Hydrocarbon Surveys is marketed by
Copeland Remote Sensing, LLC.

Production Hub Pages

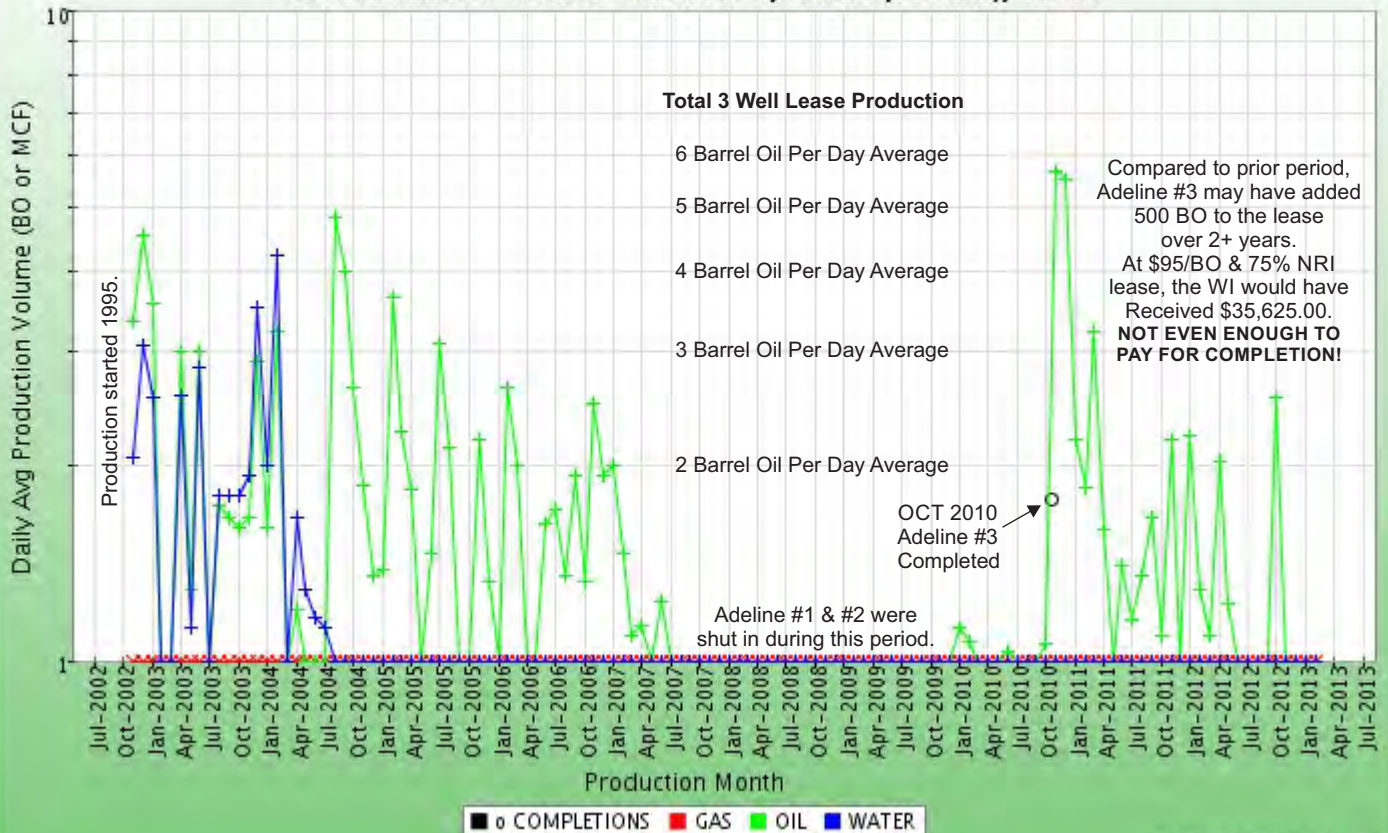


Field	Operator	Location
BATEMAN (AUSTIN CHALK)		District: 1; Bastrop County, Texas
Lease Name	Oil Lease Number	Cumulative (since 1995)
ADELINE	13929	20,386 BO; 0 MMCF
Explain		
Wells		
42-021-31496(1) 42-021-31497(2) 42-021-31616(3)		

Oil and Casinghead Gas Production

Daily Avg Production Volume (Logarithmic) vs. Time

Lease Number: 13929 - District: 1; Bastrop County, Texas



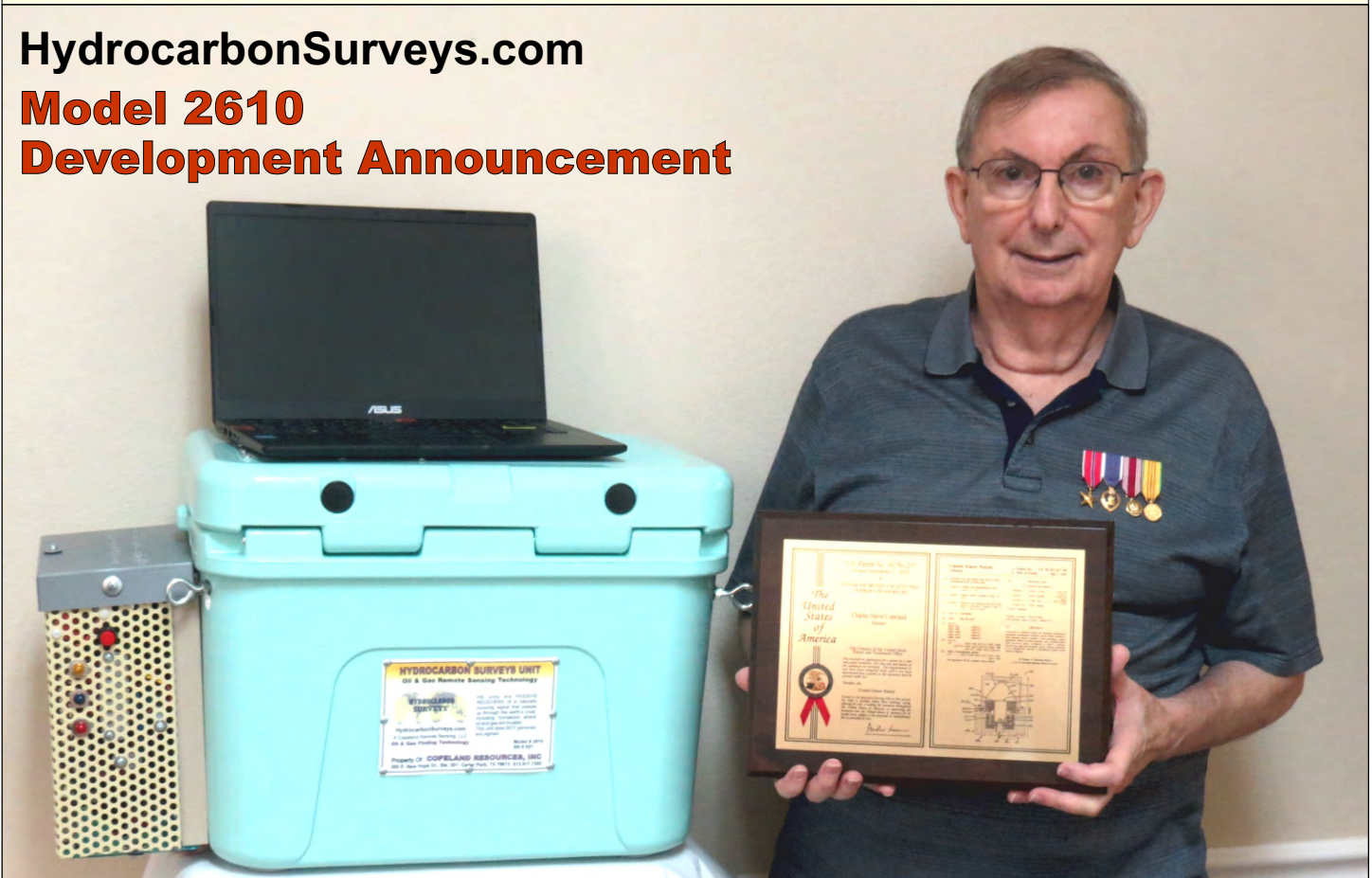
Find MORE **OIL** & **GAS** with **HYDROCARBON SURVEYS (HS)**

A UNIQUE, **PASSIVE** OIL AND GAS
REMOTE SENSING TECHNOLOGY

HydrocarbonSurveys.com

Model 2610

Development Announcement



(12) **United States Patent**
Copeland

(10) **Patent No.: US 10,761,237 B1**

(45) **Date of Patent: Sep. 1, 2020**

**Hydrocarbon Surveys technology was invented and Patented by
C. Dave Copeland, president of
Copeland Resources, Inc. and Copeland Remote Sensing, LLC.**

The company has been actively involved in the development and funding of geological prospects since 1987 and continues to develop new capabilities to work within the petroleum industry.

Mr. Copeland is proud to have served our great country against the communist invasion of South Vietnam and was decorated with a **Bronze Star** for leadership under hostile conditions.

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CopelandRemoteSensing.com

Sept. 2021

HydrocarbonSurveys – **DATA ACQUISITION** from off-road vehicle:

Hydrocarbon readings are gathered in a grid pattern at specified intervals using our proprietary HS software. Since both operator and equipment stay in the vehicle, only 30 seconds are required for each reading. As a result, hundreds of readings can be recorded by each operator in a workday.

