

CHE INC



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MET Survey Technology

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SHALE PLAY

- Example of a Positive Response for an Exploratory MET Survey in the Bakken Shale

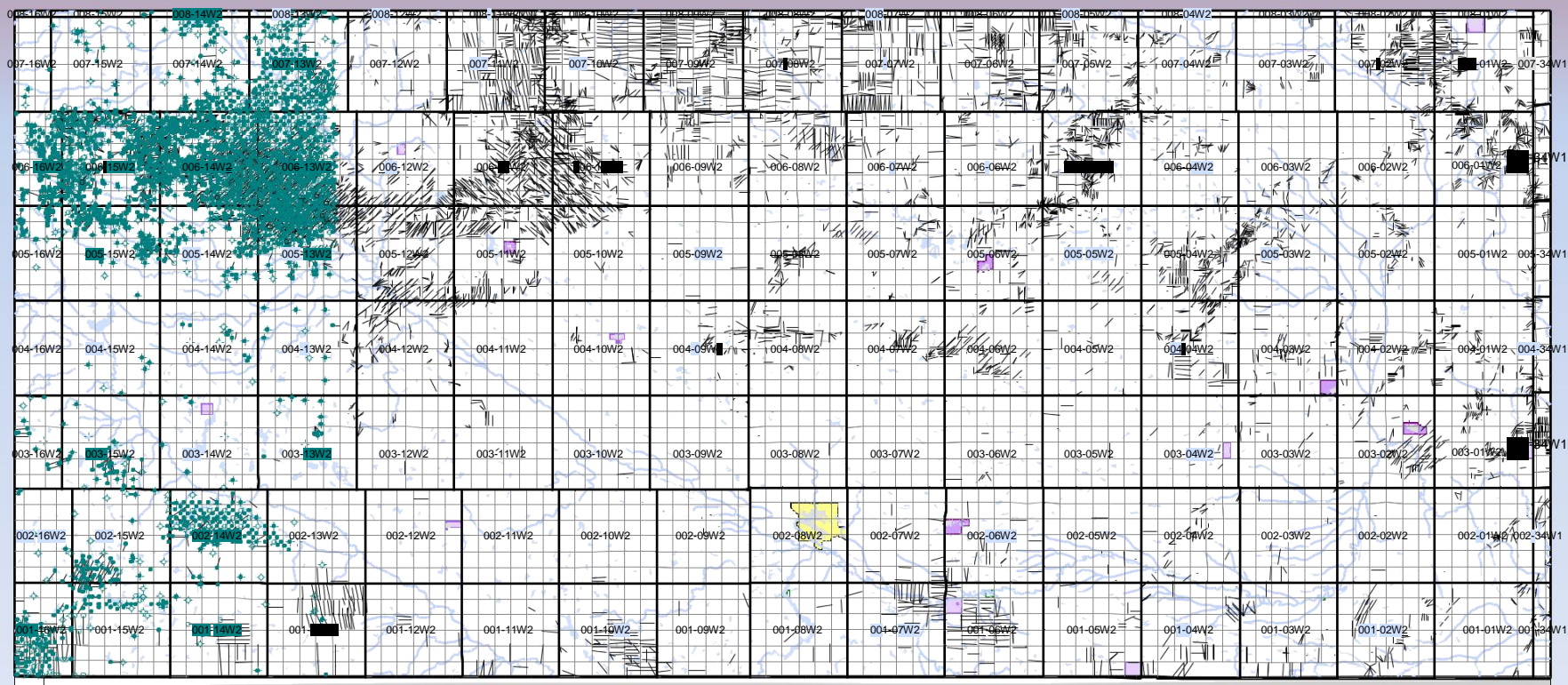


MET Coverage of the Bakken Shale Play on USA/Canada Border

MET survey coverage in T1-7 R1-15 W2 Canada. EBT has over 3 million acres of survey

Coverage in Canada, not all is shown. This is the highly productive area of the Bakken

Play along the US/Canada Border (North Dakota and Saskatchewan)





The MET Process

- MET – Microbial Exploration Technology.
- Proprietary method used by EBT to identify hydrocarbon (HC) gas microseepages.
- Accurately measures levels of bacteria in soil that metabolize HC gas.
- Can identify extremely low levels of HC gases in soil.
- Quantifying the samples collected allows EBT to generate detailed maps that can identify geochemical anomalies within the survey area.

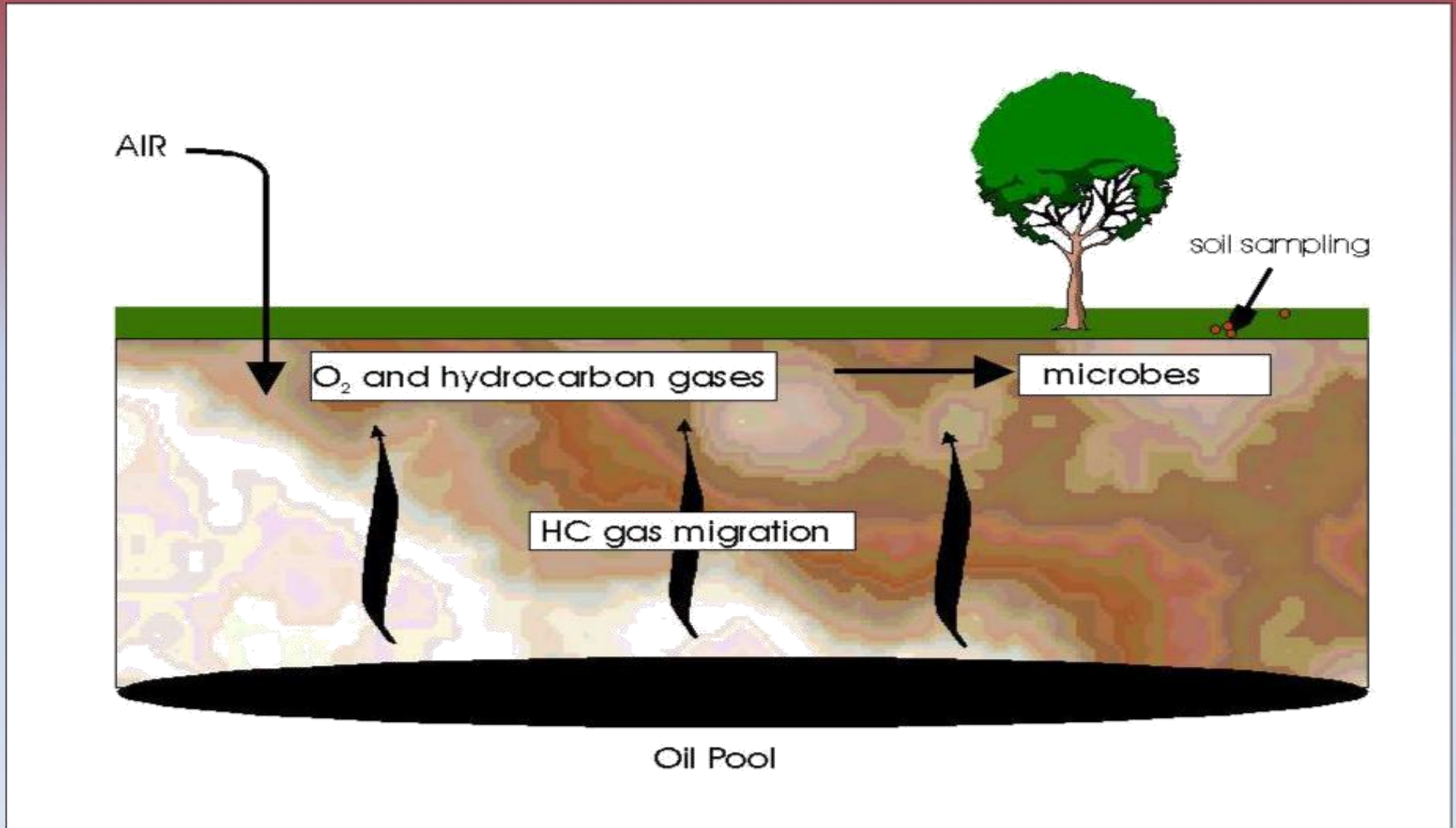


Principles of the MET Process

- Oil and gas accumulations leak hydrocarbons.
- Leakage (or microseepage) has a vertical migration to surface.
- Bacteria can utilize the hydrocarbon gas from a microseepage as a nutrient source.
- Identifying and measuring the bacterial population can identify subsurface hydrocarbon accumulations.



The MET Process





Exploration Example Maps

- The following maps demonstrate how a MET survey can identify exploration well locations.
- The Canadian township (100 sq. km) example had limited drilling at the time of the survey (1997).
- Please note that industry drilled these locations **WITHOUT** knowledge or use of MET data.
- Conversely, MET recommendations were based **ONLY** on MET data.
- In principle, MET data should be used in conjunction with other available survey data such as seismic, etc.



Exploration Example Maps

- The following three maps show different views of the Canadian township, T1-R10-W2.
- The First map is our original survey map produced in 1997. It shows our MET survey data and pre-survey wells.
- The Second map shows our MET data and up-to-date drilling results as of 2012.
- The Third map shows our MET data and up-to-date drilling with the production bubbled to scale. The map is color coded to show pre-drilling, MET recommended drilling and Non-MET recommended drilling.

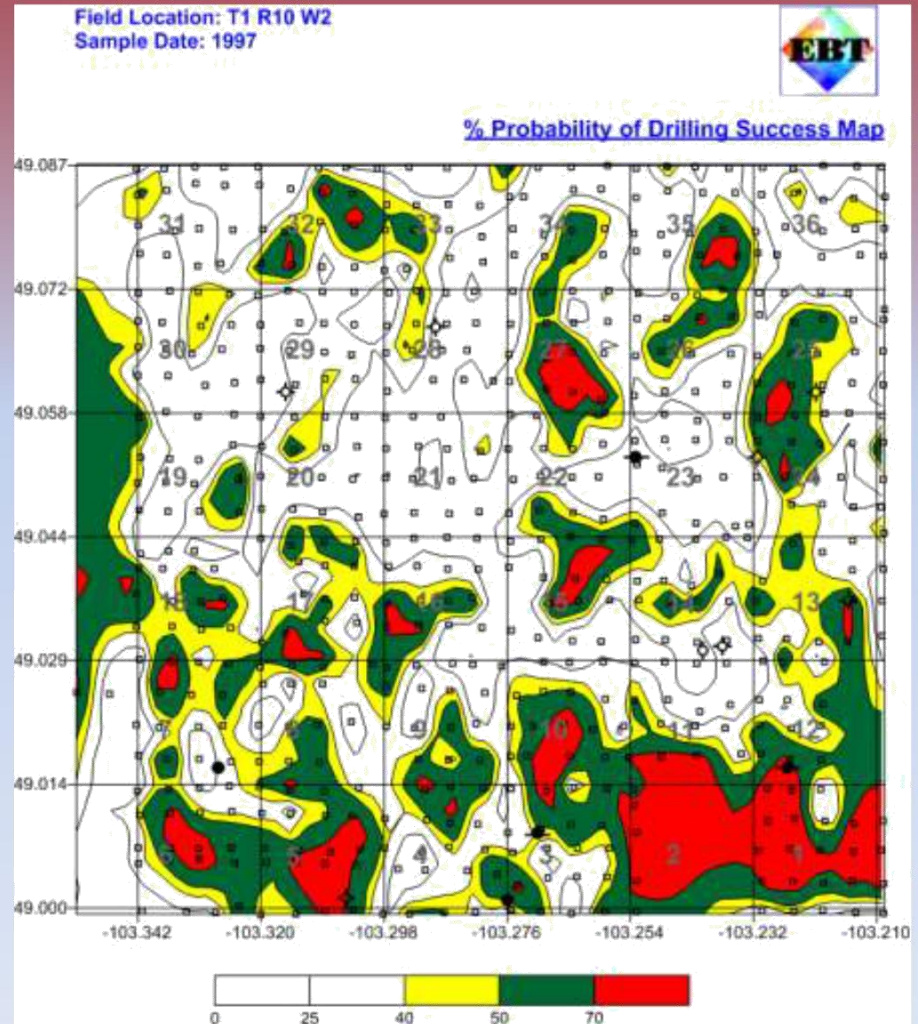


% Probability of Drilling Success

Original %PS Survey Map

This map shows the results from the MET survey completed in 1997, in the Bakken Shale Play.

Areas in red have the highest MET values, and are considered areas of interest.



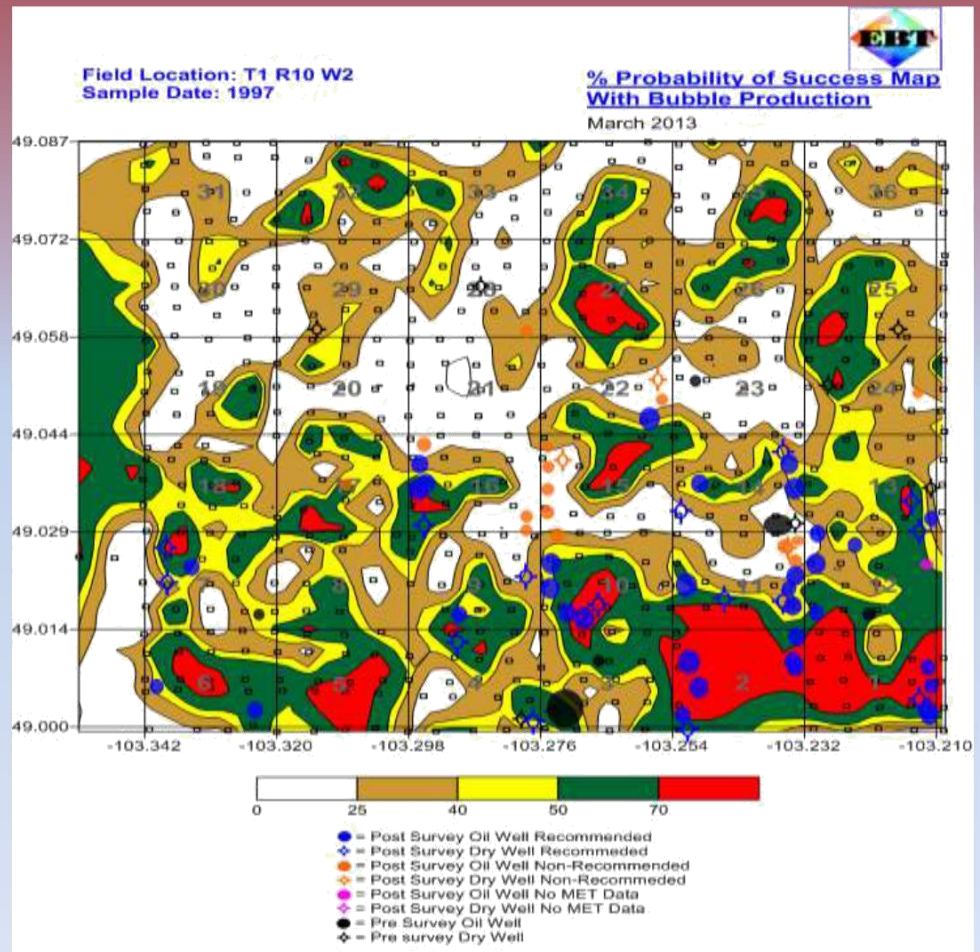


Correlation of Drilling Results with MET Survey Data

Survey Area with Production Bubble

This map shows the survey area with production bubbled to scale.

This map is color coded to represent recommended and non-recommended locations. Blue wells are recommended.





Summary of T1 R10 W2 Township Survey

- The areas of highest MET Values were in sections 1-3 and 10-12. These sections produced 65% of the oil from the township.
- IOP of **MET recommended locations was 200 BOPD** while IOP from **non recommended locations was 131 BOPD (52% greater)**.
- Of the top 10 producing wells, 9 were at MET recommended locations.
- 8 of the 9 wells with IOP greater than 200 BOPD were MET recommended locations while only 2 of 6 wells with less than IOP of 100 BOPD were MET recommended.



Example of a Large Contiguous MET Survey

CHE-EBT MET TECHNOLOGY 2014

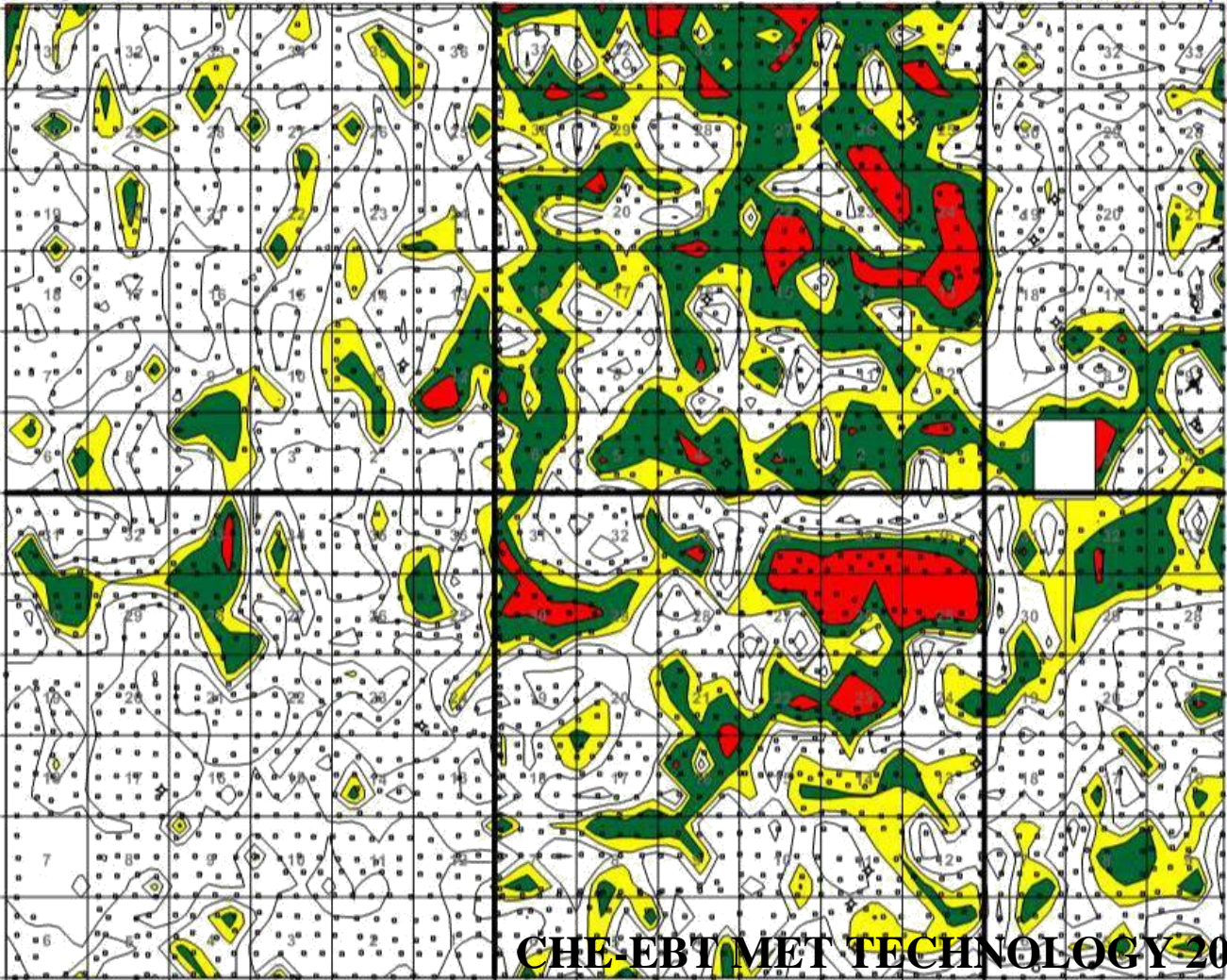


6 Township MET Survey in Canada.

Survey: 6 Township MET Survey
Field Location: Canada
Sample Date: 1997

Percent Probability of Drilling Success

Contour Map



CHE-EBT MET TECHNOLOGY 2014

Coverage Area
180 sq. miles
or 466 sq. km

Estimated Area of Interest 36 sq. miles or 93 sq. km

Benefits

- 1) Economical method to cover large areas.
- 2) High/Low Grade Areas.
- 3) Will help focus further exploration activities.

20% of the surveyed area can be considered prospective for a hydrocarbon presence



Large Block MET Surveys

- EBT has the ability to effectively survey a large exploration block for a very economical cost when compared the cost of seismic acquisition.
- MET soil samples are easy to collect, and do not require specialized equipment.
- Sampling spacing can be 0.5-1 km to cover large areas. Once an area has been identified as prospective you can design a survey with 0.25-.5 km spacing to obtain better defined hydrocarbon anomalies.



Large Block MET Surveys

- MET surveys are very time efficient.
- When field collection begins, soil shipments need to be sent to EBT's laboratory in California every two weeks. This is to preserve the microbial soil organisms.
- Once EBT has received the MET soil samples, they will begin the lab analysis immediately. It takes 7-14 days to obtain MET lab results once EBT has received the soil samples. (Depending on size of shipment)
- Within 7-21 days of the final lab results and receipt of sample coordinates for the project, EBT will be able to present the client with a final report with graphics.



Example of a Dual Survey Project: MET Survey and Seismic Acquisition

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Introduction

- This presentation is comparing 14 years of drilling data in Ecuador's Block 15. approximately 1,800 sq. km, with EBT's MET survey data that was generated in 1999.
- The MET samples were collected by the seismic crews as they were conducting seismic acquisition activities.
- PetroAmazonas (PAM) now owns and operates Block 15. EBT completed 7 subsequent surveys for PAM in Ecuador.
- PAM after reviewing EBT's Microbial Exploration Technology (MET) survey data from 1999 sent well data on 48 wells that were drilled in the MET coverage area.



Results of Block 15

- There are 48 wells reviewed.
- Five of these wells were drilled pre-survey (1999) and all five were dry wells in non recommended locations.
- All 43 wells that were drilled post-survey were successfully completed and brought on production.
- EBT would have recommended 18 of these wells. The 18 recommended wells have an average cumulative production of **1,470,000 BO.**
- 25 wells were in non-recommended locations and have an average cumulative production of **213,000 BO.**



Economics of MET Ecuador Survey

Our client was able to conduct two field studies with only one crew mobilization.

Current pricing is \$275,000 for the Block 15 MET survey, 4% of one well drilling costs.

Individual wells costs \$6-7 million to drilling.

Total drilling program was \$312 million.

**Recommended well sites (18) at \$117 million have produced 26.5 million BO.
Cost/BO produced is \$4.42/BO.**

**Non recommended well sites(30) at \$195 million have produced 6.4 million BO.
Cost/BO is \$30.46/BO, 6.9 times higher.**



Recommendations

EBT recommends using the MET survey technology jointly with seismic surveys.

The MET technology can identify areas of hydrocarbon interest, but it cannot define depth or what structures or traps are involved.

Conversely, seismic surveys can identify the sub-surface structure and traps, but is not as effective in defining if the traps and structures are charged with hydrocarbons.

When both seismic and MET are used in conjunction we believe that you will have higher success rates than when just using one technology alone.

EBT believes that the best utilization of the MET technology is to conduct the MET survey prior to or together with the seismic survey.



General Conclusions

Experience – Over 17 million acres of MET surveys around the world both on shore and offshore in 11 countries.

Accuracy – MET recommended drilling results of 81% completion and were 65% greater than non-recommended locations.

Production - MET supported wells have produced 71%-350% more oil than non recommended well locations.

Pricing - At \$3-5 per acre for a MET survey the cost is minimal in comparison to value generated.

Timely Results – MET surveys typically have a turnaround time of two weeks once the soils have been received in our lab.



- Thank you for your time
- Let us know how we can best assist you
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