



ENVIRONMENTALLY FRIENDLY DRILLING SYSTEMS PROGRAM

EFD SCORECARD

Leading the way in environmental and societal accountability

The **Environmentally Friendly Drilling (EFD)** program, managed by the Houston Advanced Research Center (HARC), integrates advanced technologies into systems that significantly reduce the footprint of petroleum drilling and production in environmentally sensitive areas. The objective is to identify, develop and transfer critical, cost effective, new technologies that can provide policy makers and industry with the ability to develop reserves in a safe and environmentally friendly manner.

The program continues to add participants from environmental organizations, academia, state and federal agencies, government laboratories, and industry. Currently over 100 organizations support this effort including financial assistance. The partnership identifies new technologies and transfers them to areas that must incorporate new practices to address environmental concerns. Regional partners optimize technologies to fit the needs of their locale. Partners routinely come together to discuss progress with the sponsors/advisors. The program was honored with the Environmental Partnership Chairman's Stewardship Award from the Interstate Oil and Gas Compact Commission at their 2009 annual meeting.



The EFD Scorecard

An environmental scorecard has been developed to measure the tradeoffs associated with implementing low impact drilling technology in environmentally sensitive areas. The scorecard assesses drilling operations and technologies with respect to air, site, water, waste management, biodiversity and societal issues. Low impact operations reduce the environmental footprint through the adoption of new methods in (1) getting materials to and from the rig site (site access), (2) reducing the rig site area, (3) using alternative drilling rig power management systems, and (4) adopting waste management at the rig site. The scorecard enables a dialog to be established and maintained among all interested, concerned and affected stakeholders. In this manner, the industry has a way of seeing itself within the larger network. The scorecard presents an ecological understanding of the tradeoffs associated with producing energy. The methodology was developed through a series of workshops being held with ecologists, botanists, wildlife management experts and others in addition to oil and gas industry experts.

EFD Facts		
Project:		
Location:		
Ecosystem:		
	Max	Score
AIR	10	0
WATER	20	0
SITE	20	0
WASTE MANAGEMENT	20	0
BIODIVERSITY/HABITAT	15	0
SOCIETAL	15	0
	100	0



- Academia**
- Texas A&M University College Station
 - Texas A&M University Kingsville
 - Mississippi State University
 - Sam Houston State
 - University of South Alabama
 - John Hopkins University
 - University of Arizona
 - University of Texas
 - University of Houston

- Environmental Organizations**
- NRDC
 - The Nature Conservancy
 - Conservation International
 - Bureau of Applied Anthropology/Arizona
 - Clinton Climate Initiative
 - Rocky Mountain Clean Air
 - McFaddin Ranch

- Industry**
- API
 - Ballard Exploration
 - BP
 - Shell
 - Chevron
 - StatoilHydro
 - ConocoPhillips
 - Devon
 - King Exploration
 - Halliburton
 - Huisman
 - National Oil Well – Varco
 - MI Swaco
 - TerraPlatform
 - T. Baker Smith
 - Weatherford
 - Derrick Equipment
 - Composite Mats
 - PTTC
 - IADC

- State/Federal Agencies**
- US Department of Energy
 - Bureau of Land Management
 - US Park Service
 - Texas Railroad Commission
 - Texas General Land Office
 - Texas Dept. of Agriculture
 - Texas Dept. of Transportation
 - US Minerals Management Services
 - Texas Parks & Wildlife
 - Texas Water Board
 - Texas Commission on Env. Quality
 - US Fish and Wildlife
 - Argonne National Laboratory
 - Big Thicket Preserve
 - Idaho National Laboratory

Participants in the development of the scorecard.

The overall objective of the scorecard is to have a means of measuring the environmental and societal tradeoffs associated with an energy development project. Industry has done an effective job of making safety a core value within each and every employee. The scorecard can assist in the development of a mindset that environmental stewardship is a core value. In addition, the scorecard enables all stakeholders to understand the balance between energy development and the impact on the environment.

What Does ‘Environmentally Friendly’ Mean?

‘Environmentally Friendly’ has become the shorthand term for the concept of developing energy resources in such a manner as to minimize the impact on the environment. The concept goes beyond environmental impact and takes into consideration societal issues as well as ensuring that technologies are cost effective.

Why Use the Scorecard?

Development of energy resources is important to the economic development and security of our nation. The scorecard enables a methodology to be employed that documents the environmental and societal tradeoffs associated with energy development. The scorecard enables operating companies to make use of the principle of *what gets measured, gets done*.

Environmentally Friendly Drilling (EFD) practices can substantially reduce negative environmental impacts and promote balance between nature and energy development. In addition, EFD practices may be cost effective, enhance public relations, increase worker productivity and reduce potential liabilities.

Having an operation certified through the use of the Scorecard can demonstrate how an operating company successfully manages operations. In addition, using EFD practices may reduce overall costs, enhance public image, increase productivity and reduce potential liability issues. EFD practices have environmental, economic, and social elements that benefit all stakeholders, including operating companies, service companies, suppliers, contractors, regulators, landowners and the general public.

Who Should Use the Scorecard?

The EFD scorecard *process* is designed to document how environmental and societal issues are addressed. The scorecard is an adaptive ecosystem services management tool that can assist in planning and implementing practices to manage operational risks. Land owners, regulators and the general public can use the scorecard to objectively assess operators’ environmental performance.

What Gets Identified, Gets Dealt With

The objective of the EFD scorecard is to have a methodology that is meaningful, simple and easy to implement and understand. Six attributes were identified as meaningful to evaluate: site (soil/sediment), water, air, waste management, biodiversity/habitat and societal issues. The scorecard process builds upon the remarkable safety improvements in a similar process. With safety, the industry reports through the International Association of Drilling Contractors and there is a commitment from each contractor to have 0 recordable incidents. The scorecard provides a means to make environmental and societal issues core business values.

Each attribute has several layers or sub-attributes. As an example, within biodiversity, the potential threat to wildlife due to proximity or timing of operations could be assessed and minimized. Drilling activities have the potential risk of temporarily interfering with wildlife. The risk can be mitigated through proper planning and monitoring of operations.

The EFD scorecard has two point levels. First are the prerequisites – those activities that must be done. Second are optional credits – those activities that are considered best practices, going beyond minimum operating requirements.

Prerequisites for the various attributes include rules and regulations that govern the drilling locations. Within the United States, regulations vary by state and address various environmental issues by geographic location.

The optional credits include various practices that can reduce the environmental and societal tradeoffs associated with oil and gas operations.

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Environmentally Friendly Drilling Program

For 20 years, we have worked to reduce our environmental footprint. Remarkable progress has been made.

The program has shown we can **reduce the footprint more than 90%** with a further reduction in the impact on the environment if low impact technologies are combined in a system.

From the past...
(multiple well sites)



...to the present drill site pad
6 times smaller and able
to access multiple wells
from **ONE** location



System includes:

- Modular small footprint rigs with reduced emissions.
- Pad drilling of multiple wells from one site.
- New downhole logging and steering tools.
- Closed loop drilling fluid systems.

Managed by the Houston Advanced Research Center (HARC), Texas A & M University, Sam Houston State University and TerraPlatforms LLC.
www.efdsystems.com

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SPONSORS



MANAGEMENT TEAM



ENVIRONMENTAL ORGANIZATIONS



COLLABORATORS



ALLIANCE MEMBERS



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