



ENERGY-SECTOR BRIEF

Maintenance Division, Roadway Asset Management



16-06 WELL COUNTY MAPS

Energy developments that rely on horizontal drilling and hydraulic fracturing (also called fracking) technologies generate enormous amounts of truck traffic on state, county, and local roads. Quantifying the number of truck trips and resulting 18-kip equivalent single axle loads (ESALs) associated with the development and operation of oil and gas wells is a critical requirement for designing and maintaining pavement structures on energy sector roads. However, this is not enough. In order to implement roadway design, construction, and maintenance plans in energy sector areas, it is also necessary to document the location, number, and characteristics of existing and planned well developments.

This energy sector brief describes how to access and use 120 county maps documenting oil and gas energy developments in the Barnett Shale, Eagle Ford Shale, and Permian Basin regions. These maps can be used for a variety of applications, including, but not limited to, documenting historical well development locations and trends as well as preparing short-term and mid-term energy development predictions. The maps are accessible online at <https://txdot.sharepoint.com/sites/division-MNT/SitePages/Home.aspx>.



INTRODUCTION

Texas A&M Transportation Institute (TTI) researchers gathered and processed data from the Railroad Commission of Texas (RRC) to document locations and trends of oil and gas energy developments in the state. The outcome of this task was a geodatabase of oil and gas developments, which included geographic information system (GIS) files of oil and gas permit locations as well as drilling permit attribute data. This database enabled the production of tables, figures, and maps to document locations and trends of oil and gas energy developments in the state. A complete description of these products is available in Research Reports RR-15-01 and RR-16-01.

A series of maps at the county level (120 maps in total) in portable document format (PDF) provide an overview of historical and recent oil and gas well development activities in the Barnett Shale, Eagle Ford Shale, and Permian Basin regions. As an illustration, Figure 1 depicts the locations of the wellheads, wellends, and directional wells in Karnes County. The maps include completed wells, expired wells, and wells that are not expired and not completed as of December 31, 2015.

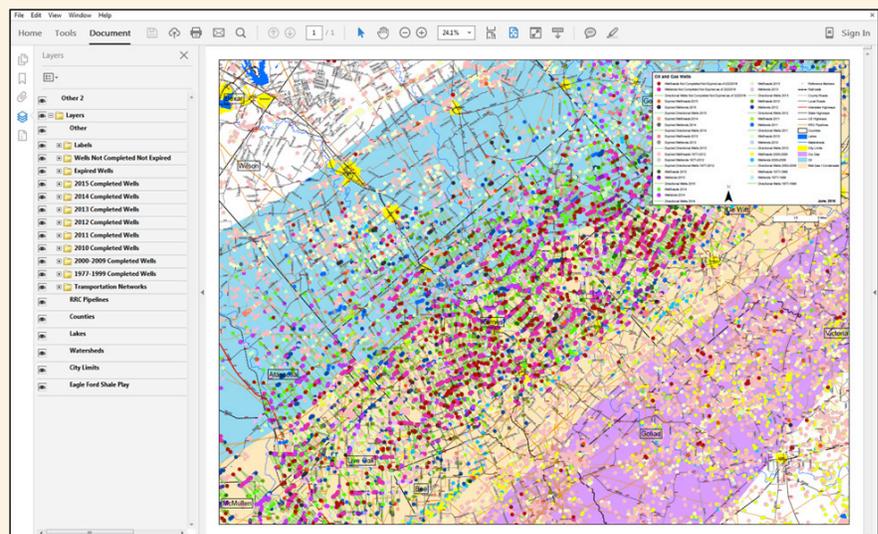


Figure 1. PDF Map Document for Karnes County with Layers.

INSTRUCTIONS

Each PDF file contains layers that can be turned on or off, each layer representing a specific type of information, as shown in Figure 2. The layers panel is visible on the left side of the document. By clicking the "eye" next to each layer, the layers may be turned off or on. Completed wells are grouped by completion year as classified by the Railroad Commission. Not completed and not expired wells are shown individually. Several background layers are included in the maps, such as the roadways, railroads, pipelines, county lines, city limits, and geological formations. The labels for county, city, and major roadway names may be turned off and on from the layer panel.

INSTRUCTIONS (continued)

To access the maps:

- Go to the Maintenance Division's SharePoint site:
- Click on the Energy Sector picture and select Maps from the menu. The maps are organized by district.

To view the maps:

- Load the map on a PDF viewer such as Adobe Acrobat Reader.
- To open the layers panel, click the fourth button down on the left window pane.
- To expand a folder to view the individual layers, click the plus sign.
- To turn layers off, click the "eye" next to the layer or folder. To turn the layer on, click the empty box where the eye was located next to the layer or folder. Keep in mind that turning a folder "off" or "on" removes or adds all layers within the folder to the map.

LAYER DESCRIPTION

Oil and Gas Related Layers

- **Wells not Completed Not Expired.** These are wells that have not been completed and whose permits have not expired as of February 2, 2016. It is expected that these wells are currently active or will become so in the near future. Locations are included for wellheads, wellends, and directional wells.
- **Expired Wells.** This layer includes wells that were not completed and have expired permits. A permit issued by the RRC is valid for two years after the date of issue. The expired wells may be reentered in the future, but doing so would require a new permit. The expired wells are grouped by type of well (wellhead, wellend, and directional) as well as by year. Recent activities take precedence in regards to maintenance activities; as such, the expired wells are shown in separate layers for 2013, 2014, and 2015, while the expired wells from 1977 to 2012 are shown in a single layer.
- **Completed Wells.** Individual folders are created for wells completed in 2010–2015, while the wells completed in 2000–2009 and from 1977–1999 are grouped together. The layers are grouped by type of well, including wellheads, wellends, and directional wells. A completed well means that a well that was permitted for activity by the Railroad Commission, drilling was completed, and the well is ready for production.

Background Information Layers

- **Transportation Networks.** This folder includes layers for the railroads and roadways in Texas.
- **RRC Pipelines.** This layer includes the location of all pipelines in Texas as reported by the RRC.
- **Counties.** This layer depicts the county boundaries for every county in Texas.
- **City Limits.** This layer shows the location and limits of major cities in Texas.
- **Eagle Ford Shale Play.** This layer depicts the location of the Eagle Ford Shale Play, including the dry gas, oil, and wet gas regions within the play.
- **Labels.** Labels are included for counties, cities, and major roadways.

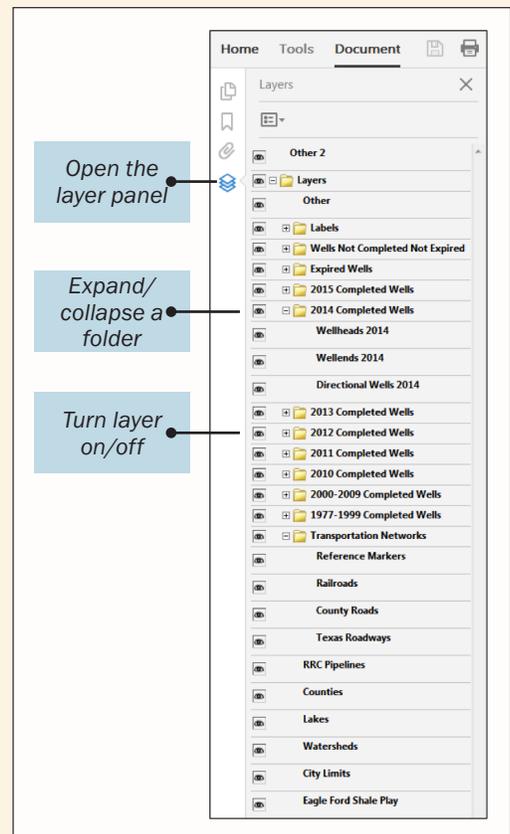


Figure 2. PDF Map Layer Menu.

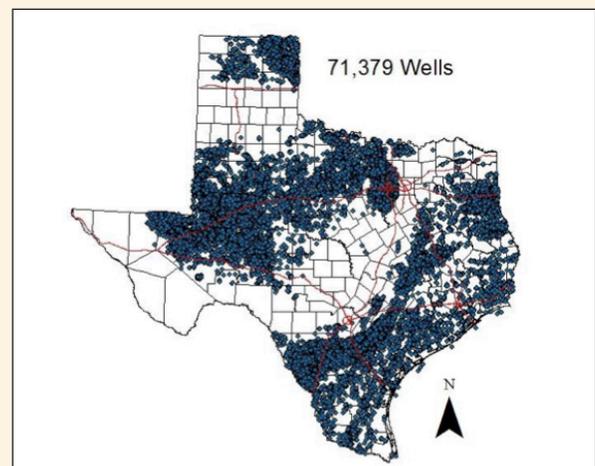


Figure 3. Completed Oil and Gas Wells in Texas (2010-2014)

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