

# Sysdrill Designer

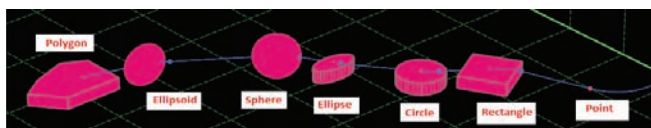
## Interactive graphic well planning in SeisEarth

### A Powerful Well Planning Tool

Paradigm™ Sysdrill™ Designer is a powerful well planning tool for the geoscientist, embedded in the Paradigm SeisEarth™ interpretation suite. Sysdrill Designer allows quick and easy well design using editable constraints. Advanced Epos™ data management features enable rapid selection and loading of large data sets.

### Target Picking

The position and orientation of targets can be picked and updated by digitizing points in the 3D and 2D scenes, and graphically manipulated to allow alignment with geological features.



▲ Target shape options

Targets can be picked in both time migrated and depth domains. Time depth conversion references can be specified for a drilling project or individual well by using either a Global Velocity Model or offset well check shot.

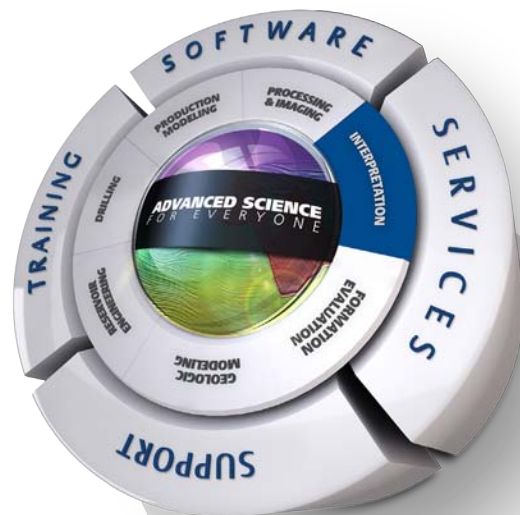
The target manipulator allows the target position, size rotation and dip to be updated graphically.

### Design Constraints

The drilling project allows the user to set predefined design parameters and limits. These values are used in the default well path design; any parameter exceeding the defined limits is indicated by highlighting in the user interface and 2D and 3D views.

Default Planning Parameters					
Kick Off Depth	500.00	ft	DLS (First)	2.00	dega/ft(100)
Inclination at Target	55.00	dega	DLS (Subsequent)	5.00	dega/ft(100)
Design Limits					
Measured Depth	15000.00	ft	Vertical Depth	10000.00	ft
Vertical Section	8000.00	ft	DDI	6.4 to 6.8	
Inclination	75.00	dega			
Parameters					
Parameter	Value	Limit	Parameter	Value	
✓ Max MD	10895.36	15000.00 ft	Total Turn	0.00 dega	
✓ Max TVD	5897.35	10000.00 ft	Total Curve	76.23 dega	
✓ Vertical Section	7443.52	8000.00 ft	DOAWP	7443.52 ft	
✓ DLS (First)	2.00	2.00 dega/ft(100)			
✓ DLS (Subsequent)	5.00	5.00 dega/ft(100)			
✗ Max Inc	76.23	75.00 dega			
✓ DDI	6.02	6.80			

▲ Well planning parameters and constraints



### Well Planning

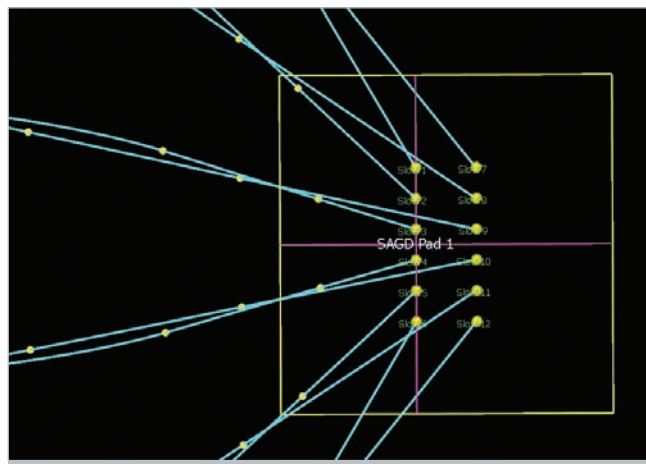
Well paths are automatically calculated from surface location to target using a number of design options and predefined planning parameters. Vertical, continuous build, J, S and double curve well profiles are available. Designs can be edited by constraining kick off, DLS and inclination values.

Wells can be tied to a single surface location, platform or offset well (including Epos/Geolog™ wells). The tie point can be graphically picked in the 3D scene and platforms and slots can be quickly and easily created and multiple wells assigned.

The multi-well picking mode enables multiple target sequences or well paths to be picked sequentially, allowing rapid creation of multiple wells or target sequences for field development planning.

### Platforms

Multiple well platforms or drilling pads can be created and edited graphically. Wells can be assigned and moved between platforms. A summary of well parameters for each platform can be used to determine optimum platform position, in addition to a Platform Optimizer function that places the platform so as to minimize the chosen well parameters. Platforms can be automatically generated from a selection of wells.



▲ Pad design - SAGD wells

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## Visualization

Well paths are immediately displayed in SeisEarth interpretation windows. Multiple wells and sidetracks are recalculated and displayed when updating platform locations. Wells, Targets, Slots and Platforms can be selected individually and display properties can be changed, for easy visual identification. Highlighting in the user interface and 2D & 3D views indicates if design limits have been exceeded.

Planned wells can be used to create a traverse for QC and visualization, which can then be used in other Epos applications.

## Data Management

Sysdrill Designer Wells are stored in the new Epos Drilling Data Service (DDS) database. This allows cross-disciplinary collaboration via direct data sharing with engineers using the industry-leading Sysdrill drilling engineering data model. The drilling database includes a sophisticated engineering model of the well, including survey history, positional uncertainty and magnetic declination records. Detailed descriptions of casings, fluids, assemblies and various properties are stored for use in the drilling engineering applications.

Querying and filtering tools allow rapid selection and loading of large data sets based on a number of well parameters. Advanced data management tools enable access control to be set for individual wells.

A Drilling Data Manager application is available for those involved in data management to administer Epos drilling databases and control access to well data.

Third-party data exchange is enabled via Wellbore Planner file, Direct Epos link and export to .las format.

## Features

- 3D geometric target definition
- Time migrated and depth domain support
- Graphical interaction and manipulation of targets and platforms
- Visual validation against predefined constraints
- Customizable coordinate systems
- Export data in common formats

## Interoperability

All Epos™-based applications enable interoperability with third-party data stores, including:

- RESQML 2.0.1
- OpenWorks® R5000.10
- GeoFrame® 2012
- Petrel\* 2017 & 2016
- Recall™ 5.4.2

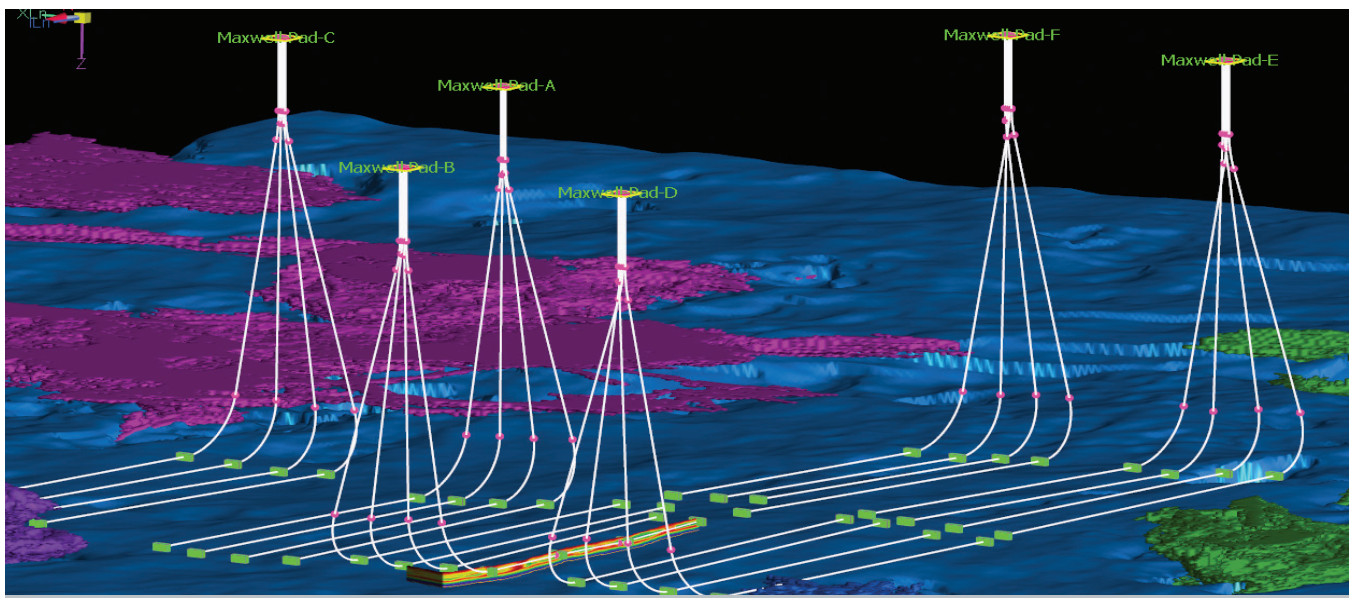
(\* is a mark of Schlumberger)

## System Specifications

- 64-bit Microsoft® Windows® 7, 8.1, 10 (64-bit)
- 64-bit Red Hat® Enterprise Linux® 6.8 and subsequent minor releases, and 7.1 and subsequent minor releases

## The Paradigm Advantage

- Multiple target picking and automated well planning enable rapid well design.
- Pre-defined drilling constraints reduce well planning cycle time.
- Control inclination and direction at target optimize entry into the reservoir.
- Co-visualization of drilling and subsurface seismic data helps validate well designs.
- Platform and slot support enables rapid field development scenario planning.



▲ Multi-target, multi-well, multi-platform design



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