

PathTracker

Making Drilling Easier

Tips | Tricks | News-Info | #6

PathTracker 6.0 Proximity module



The PathTracker 6.0 Proximity module is very rich in functionality and very easy to use. The Proximity Module lets the Direction Driller monitor the plan and anti-collision wells at the same time. **IMG 1** contains an active survey file on the left and the Proximity screen on the right. Clicking on the last survey row (90) and clicking on the Proximity icon on the tool bar (or pressing F5 on the keyboard) will display relevant proximity information in the right screen.

Section calculated on: 315.6035 Calculation Method: Minimum Curvature

| # | Depth | Inc | Azimuth | TVD | North | East | Section | Dogleg | BldRate | Trnrate | Comment |
|----|---------|---------|---------|---------|--------|--------|---------|--------|---------|---------|---------|
| | Meters | Degrees | Degrees | Meters | Meters | Meters | Meters | /30m | /30m | /30m | |
| 67 | 2850.42 | 1.83 | 299.88 | 2849.32 | 31.57 | -24.80 | 39.91 | 0.25 | 0.06 | 7.51 | |
| 68 | 2860.06 | 2.10 | 302.68 | 2858.96 | 31.74 | -25.09 | 40.23 | 0.89 | 0.84 | 8.71 | |
| 69 | 2869.69 | 2.80 | 302.05 | 2868.58 | 31.96 | -25.43 | 40.63 | 2.18 | 2.18 | 1.96 | |
| 70 | 2879.32 | 3.16 | 302.40 | 2878.20 | 32.23 | -25.86 | 41.12 | 1.12 | 1.12 | 1.09 | |
| 71 | 2888.46 | 3.15 | 306.47 | 2887.32 | 32.52 | -26.27 | 41.61 | 0.74 | 0.03 | 13.36 | |
| 72 | 2897.98 | 3.33 | 304.89 | 2896.83 | 32.83 | -26.71 | 42.14 | 0.63 | 0.57 | 4.98 | |
| 73 | 2907.61 | 3.53 | 306.35 | 2906.44 | 33.16 | -27.18 | 42.71 | 0.68 | 0.62 | 4.55 | |
| 74 | 2926.73 | 4.22 | 305.20 | 2925.52 | 33.92 | -28.23 | 43.98 | 1.09 | 1.08 | 1.80 | |
| 75 | 2936.20 | 4.69 | 306.17 | 2934.96 | 34.35 | -28.82 | 44.71 | 1.51 | 1.49 | 3.07 | |
| 76 | 2945.65 | 5.20 | 305.49 | 2944.37 | 34.83 | -29.48 | 45.51 | 1.63 | 1.62 | 2.16 | |
| 77 | 2955.19 | 5.52 | 306.67 | 2953.87 | 35.35 | -30.20 | 46.39 | 1.06 | 1.01 | 3.71 | |
| 78 | 2964.59 | 6.09 | 303.47 | 2963.22 | 35.90 | -30.98 | 47.32 | 2.09 | 1.82 | 10.21 | |
| 79 | 2974.22 | 6.34 | 305.22 | 2972.80 | 36.48 | -31.84 | 48.35 | 0.98 | 0.78 | 5.45 | |
| 80 | 2983.85 | 7.34 | 303.12 | 2982.36 | 37.13 | -32.79 | 49.47 | 3.21 | 3.12 | 6.54 | |
| 81 | 2993.47 | 8.06 | 303.94 | 2991.89 | 37.84 | -33.87 | 50.73 | 2.27 | 2.25 | 2.56 | |
| 82 | 3003.11 | 8.88 | 304.25 | 3001.43 | 38.63 | -35.04 | 52.12 | 2.56 | 2.55 | 0.96 | |
| 83 | 3012.59 | 9.76 | 306.41 | 3010.78 | 39.52 | -36.29 | 53.63 | 3.00 | 2.78 | 6.84 | |
| 84 | 3022.12 | 10.35 | 307.39 | 3020.16 | 40.52 | -37.63 | 55.28 | 1.93 | 1.86 | 3.08 | |
| 85 | 3031.81 | 10.33 | 308.15 | 3029.70 | 41.59 | -39.00 | 57.00 | 0.43 | 0.06 | 2.35 | |
| 86 | 3041.50 | 10.57 | 309.09 | 3039.23 | 42.69 | -40.37 | 58.74 | 0.91 | 0.74 | 2.91 | |
| 87 | 3051.14 | 10.64 | 308.85 | 3048.70 | 43.80 | -41.75 | 60.51 | 0.26 | 0.22 | 0.75 | |
| 88 | 3060.61 | 10.65 | 308.70 | 3058.01 | 44.90 | -43.12 | 62.24 | 0.09 | 0.03 | 0.48 | |
| 89 | 3070.29 | 10.49 | 308.75 | 3067.52 | 46.01 | -44.50 | 64.01 | 0.50 | 0.50 | 0.15 | |
| 90 | 3079.79 | 10.03 | 309.16 | 3076.87 | 47.07 | -45.82 | 65.69 | 1.47 | 1.45 | 1.29 | |

Proximity Results

Reference Well: Big Well 1 (Reference Well)

Start Depth: 3079.79 End Depth: 3079.79

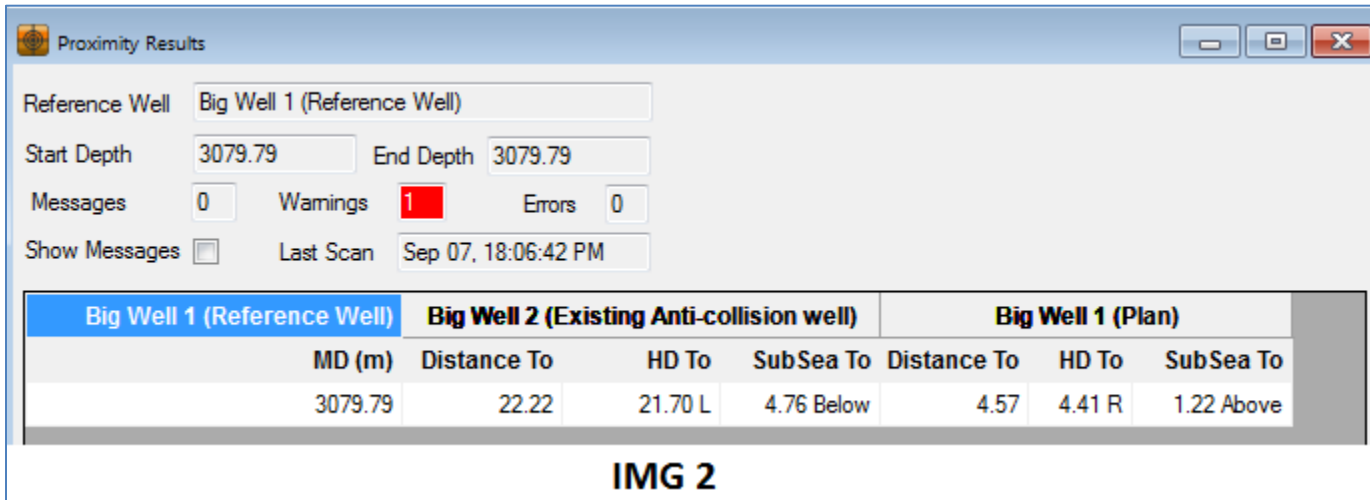
Messages: 0 Warnings: 1 Errors: 0

Show Messages: Last Scan: Sep 07, 17:57:03 PM

| Big Well 1 (Reference Well) | | Big Well 2 (Existing Anti-collision well) | | Big Well 1 (Plan) | | |
|-----------------------------|-------------|---|------------|-------------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3079.79 | 22.22 | 21.70 L | 4.76 Below | 4.57 | 4.41 R | 1.22 Above |

IMG 1

Let's take a closer look at the proximity screen (**IMG 2**)



The screenshot shows a software window titled "Proximity Results". It contains input fields for "Reference Well" (Big Well 1 (Reference Well)), "Start Depth" (3079.79), and "End Depth" (3079.79). It also displays counts for "Messages" (0), "Warnings" (1, highlighted in red), and "Errors" (0). A "Show Messages" checkbox is unchecked, and the "Last Scan" time is "Sep 07, 18:06:42 PM". Below this is a table with three main columns: "Big Well 1 (Reference Well)", "Big Well 2 (Existing Anti-collision well)", and "Big Well 1 (Plan)". The table has three sub-columns: "MD (m)", "Distance To", "HD To", "SubSea To", "Distance To", "HD To", and "SubSea To". The data row shows values for each of these columns.

| Big Well 1 (Reference Well) | Big Well 2 (Existing Anti-collision well) | | | Big Well 1 (Plan) | | |
|-----------------------------|---|---------|------------|-------------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3079.79 | 22.22 | 21.70 L | 4.76 Below | 4.57 | 4.41 R | 1.22 Above |

IMG 2

Column 1 -> Reference Well

- Contains the MD that corresponds to the **3079.79 MD** in Row 90 of the Reference well.

Column 2 -> Anti-collision well

- Distance To: The closest point (real or interpolated) in the Anti-collision well is **22.22m** from **3079.79MD** in the Reference Well
- HD To: The horizontal distance between the closest point (real or interpolated) in the Anti-collision well and **3079.79MD** in the Reference Well. In this case the HD is **21.70m** and **L** means the point in the Anti-collision well is **Left** of **3079.79MD**.
- SubSea To: The closest point (real or interpolated) in the Anti-collision well is **4.76m below** the **3079.79MD** in the Reference well

Column 2 -> Plan

- Distance To: The closest point (real or interpolated) in the Plan well is **4.57m** from **3079.79MD** in the Reference Well
- HD To: The horizontal distance between the closest point (real or interpolated) in the Plan well and **3079.79MD** in the Reference Well. In this case the HD is **4.41m** and **R** means the point in the Plan well is **Right** of **3079.79MD**.
- SubSea To: The closest point (real or interpolated) in the Plan well is **1.22m above** the **3079.79MD** in the Reference well

Important: The Proximity screen

- Can be placed on a 2nd monitor
- Can be configured by the DD to display several other proximity calculations (later in this document).
- Can display much more information about the survey point (INC, AZI, etc.) by placing the mouse cursor over a value for a few seconds and wait for a popup screen (later in this document)

Next

- Add another survey row MD = 3089.40, INC = 9.83 and AZI = 308.55
- Click on the Proximity Icon in the tool bar (or F5 on Keyboard)

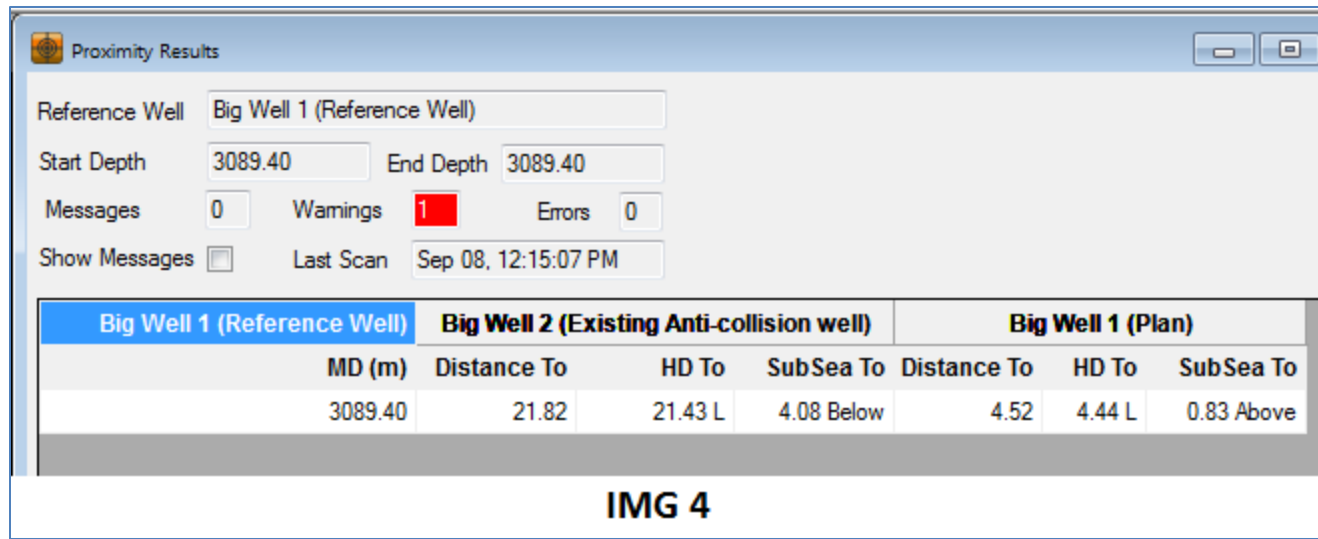
And the Proximity screen now displays the proximity numbers for 3089.40MD in the Reference well (**IMG 3** and **IMG 4**)

The screenshot displays the 'Proximity Results' window. The main window shows a table of survey data with columns: #, Depth (Meters), Inc (Degrees), Azimuth (Degrees), TVD (Meters), North (Meters), East (Meters), Section (Meters), Dogleg (/30m), BldRate (/30m), TrnRate (/30m), and Comment. The data is calculated on section 315.6035 using the Minimum Curvature method. The last row (91) is highlighted, showing Depth 3089.40, Inc 9.83, and Azimuth 308.55.

The 'Proximity Results' window is open, showing the Reference Well 'Big Well 1 (Reference Well)' and the End Depth 3089.40. The Messages, Warnings, and Errors counts are all 0. The Last Scan is Sep 08, 12:15:07 PM. The window displays proximity data for three wells:

| Big Well 1 (Reference Well) | | Big Well 2 (Existing Anti-collision well) | | Big Well 1 (Plan) | | |
|-----------------------------|-------------|---|------------|-------------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3089.40 | 21.82 | 21.43 L | 4.08 Below | 4.52 | 4.44 L | 0.83 Above |

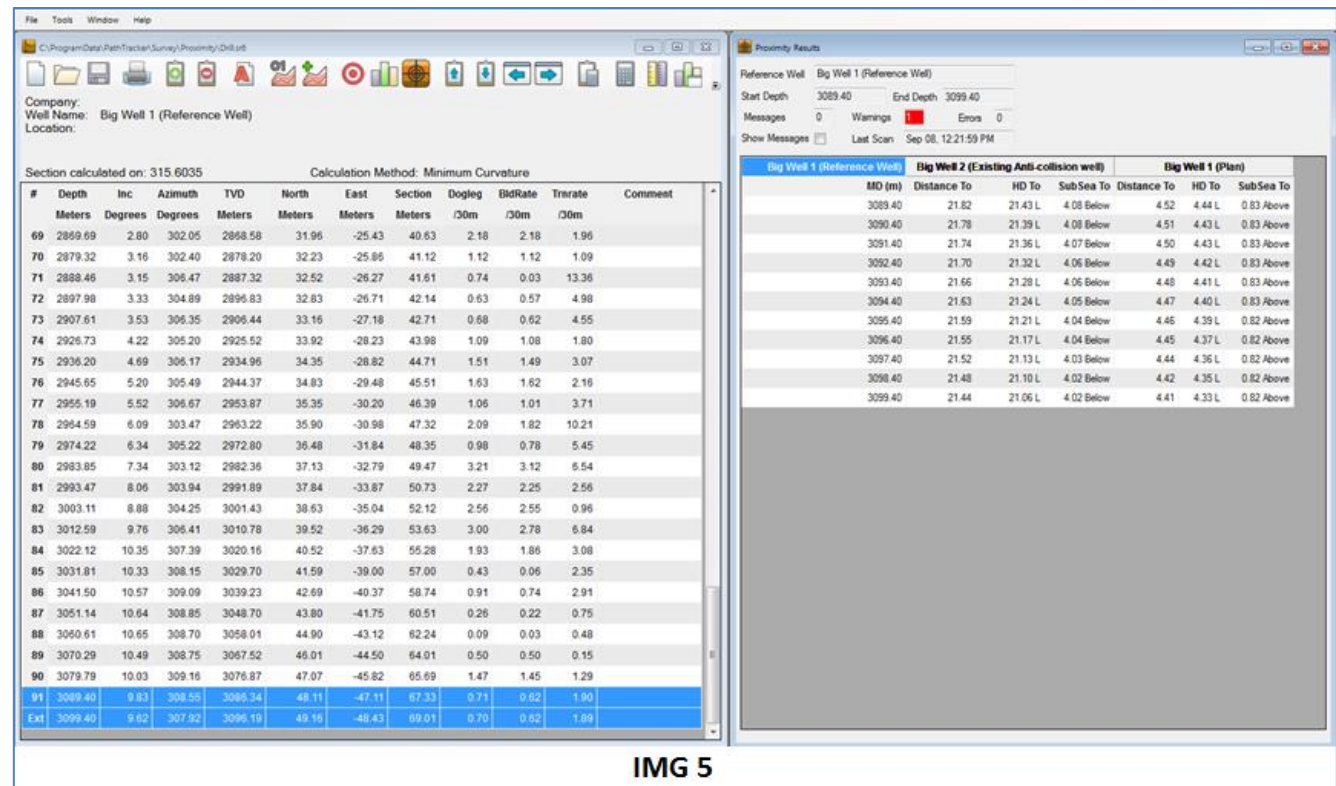
IMG 3



Next

- Add extrapolated point MD = 3099.4, INC = 9.62 and AZI = 307.92
- Click anywhere in ROW 91, hold mouse down and drag mouse to highlight cells in both rows 91 and EXT.
- Click on the Proximity Icon in the tool bar (or F5 on Keyboard)

The proximity screen now displays proximity information for 3089.4MD, 3099.40MD and 8 interpolated points in between (**IMG 5** and **IMG 6**)



The extrapolated 10m range shows the Reference well will get closer to both the Anti-collision well and the Plan well.

Proximity Results

Reference Well

Big Well 1 (Reference Well)

Start Depth

3089.40

End Depth

3099.40

Messages

0

Warnings

1

Errors

0

Show Messages

☐

Last Scan

Sep 08, 12:21:59 PM

| Big Well 1 (Reference Well) | Big Well 2 (Existing Anti-collision well) | | | Big Well 1 (Plan) | | |
|-----------------------------|---|---------|------------|-------------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3089.40 | 21.82 | 21.43 L | 4.08 Below | 4.52 | 4.44 L | 0.83 Above |
| 3090.40 | 21.78 | 21.39 L | 4.08 Below | 4.51 | 4.43 L | 0.83 Above |
| 3091.40 | 21.74 | 21.36 L | 4.07 Below | 4.50 | 4.43 L | 0.83 Above |
| 3092.40 | 21.70 | 21.32 L | 4.06 Below | 4.49 | 4.42 L | 0.83 Above |
| 3093.40 | 21.66 | 21.28 L | 4.06 Below | 4.48 | 4.41 L | 0.83 Above |
| 3094.40 | 21.63 | 21.24 L | 4.05 Below | 4.47 | 4.40 L | 0.83 Above |
| 3095.40 | 21.59 | 21.21 L | 4.04 Below | 4.46 | 4.39 L | 0.82 Above |
| 3096.40 | 21.55 | 21.17 L | 4.04 Below | 4.45 | 4.37 L | 0.82 Above |
| 3097.40 | 21.52 | 21.13 L | 4.03 Below | 4.44 | 4.36 L | 0.82 Above |
| 3098.40 | 21.48 | 21.10 L | 4.02 Below | 4.42 | 4.35 L | 0.82 Above |
| 3099.40 | 21.44 | 21.06 L | 4.02 Below | 4.41 | 4.33 L | 0.82 Above |

Proximity Results

Reference Well

Big Well 1 (Reference Well)

Start Depth

3089.40

End Depth

3099.40

Messages

0

Warnings

1

IMG 6

IMG 6

Survey Data in proximity screen

Holding the mouse cursor over a **MD** point or **Distance To** point will display a pop up screen that shows relevant survey information.

IMG 7 shows a popup screen activated by holding the mouse over 21.82 in the first row. The survey information is about the closest point in the Anti-collision well. Some of this information is configurable by the DD. There is more information on configuring the popup later in this document.

Below 4.46 4.39 0.22 Above

Proximity Results

Reference Well Big Well 1 (Reference Well)

Start Depth 3089.40 End Depth 3099.40

Messages 0 Warnings 1 Errors 0

Show Messages ☐ Last Scan Sep 08, 12:21:59 PM

| Big Well 1 (Reference Well) | Big Well 2 (Existing Anti-collision well) | Big Well 1 (Plan) | | | | |
|-----------------------------|---|-------------------|------------|-------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3089.40 | 21.82 | 21.43 L | 4.08 Below | 4.52 | 4.44 L | 0.83 Above |
| 3090.40 | 21 | | 4.08 Below | 4.51 | 4.43 L | 0.83 Above |
| 3091.40 | 21 | | 4.07 Below | 4.50 | 4.43 L | 0.83 Above |
| 3092.40 | 21 | | 4.06 Below | 4.49 | 4.42 L | 0.83 Above |
| 3093.40 | 21 | | 4.06 Below | 4.48 | 4.41 L | 0.83 Above |
| 3094.40 | 21 | | 4.05 Below | 4.47 | 4.40 L | 0.83 Above |
| 3095.40 | 21 | | 4.04 Below | 4.46 | 4.39 L | 0.82 Above |
| 3096.40 | 21 | | 4.04 Below | 4.45 | 4.37 L | 0.82 Above |
| 3097.40 | 21 | | 4.03 Below | 4.44 | 4.36 L | 0.82 Above |
| 3098.40 | 21 | | 4.02 Below | 4.42 | 4.35 L | 0.82 Above |
| 3099.40 | 21 | | 4.02 Below | 4.41 | 4.33 L | 0.82 Above |

HRZ : No

MD : 3095.00

INC : 12.02

AZI : 314.82

TVD : 3090.42

SS : -2109.12

GN : 32.36

GE : -32.57

IncTo : 79.21

AziTo : 137.28

ToolF : -171.42

Y Offto : -21.58

X Offto : -3.25

IMG 7

IMG 7

Set Up

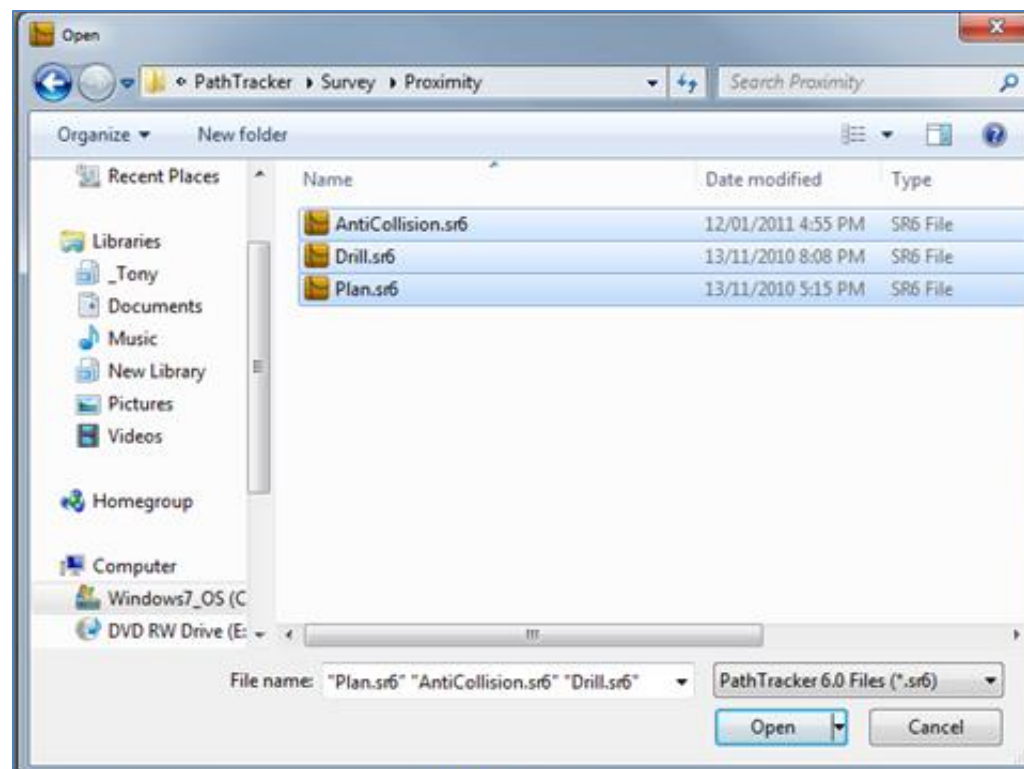
PathTracker lets a DD open 30 or more Survey Files at a time. The example above requires 3 files to be opened.

- A Reference Well
- An Anti-collision well
- A Plan

Step 1: Open the 3 wells at the same time. This can be done by selecting FILE -> OPEN SURVEY FILE from the main menu and highlighting the required files. Clicking the OPEN command will open the 3 survey files at the same time. (See **IMG 8**)

Step 2: Minimize the plan and anti-collision wells. You can do this by selecting WINDOW->TILE VERTICAL from the main menu and clicking the “-” in the top right corner of both wells.

Step 3: Use the mouse to resize the Actual / Drill well so it is big enough to see all columns.



IMG 8

Company:
Well Name: Big Well 1 (Reference Well)
Location:

Section calculated on: 315.6035 Calculation Method: Minimum Curvature

| # | Depth Meters | Inc Degrees | Azimuth Degrees | TVD Meters | Sub-Sea Meters | North Meters | East Meters | Section Meters | Dogleg /30m | BldRate /30m | TrRate /30m | Comment |
|----|-----------------|----------------|--------------------|---------------|-------------------|-----------------|----------------|-------------------|----------------|-----------------|----------------|---------|
| 74 | 2926.73 | 4.22 | 305.20 | 2925.52 | -1944.22 | 33.92 | -28.23 | 43.98 | 1.09 | 1.08 | 1.80 | |
| 75 | 2936.20 | 4.69 | 306.17 | 2934.96 | -1953.66 | 34.35 | -28.82 | 44.71 | 1.51 | 1.49 | 3.07 | |
| 76 | 2945.65 | 5.20 | 305.49 | 2944.37 | -1963.07 | 34.83 | -29.48 | 45.51 | 1.63 | 1.62 | 2.16 | |
| 77 | 2955.19 | 5.52 | 306.67 | 2953.87 | -1972.57 | 35.35 | -30.20 | 46.39 | 1.06 | 1.01 | 3.71 | |
| 78 | 2964.59 | 6.09 | 303.47 | 2963.22 | -1981.92 | 35.90 | -30.98 | 47.32 | 2.09 | 1.82 | 10.21 | |
| 79 | 2974.22 | 6.34 | 305.22 | 2972.80 | -1991.50 | 36.48 | -31.84 | 48.35 | 0.98 | 0.78 | 5.45 | |
| 80 | 2983.85 | 7.34 | 303.12 | 2982.36 | -2001.06 | 37.13 | -32.79 | 49.47 | 3.21 | 3.12 | 6.54 | |
| 81 | 2993.47 | 8.06 | 303.94 | 2991.89 | -2010.59 | 37.84 | -33.87 | 50.73 | 2.27 | 2.25 | 2.56 | |
| 82 | 3003.11 | 8.88 | 304.25 | 3001.43 | -2020.13 | 38.63 | -35.04 | 52.12 | 2.56 | 2.55 | 0.96 | |
| 83 | 3012.59 | 9.76 | 306.41 | 3010.78 | -2029.48 | 39.52 | -36.29 | 53.63 | 3.00 | 2.78 | 6.84 | |
| 84 | 3022.12 | 10.35 | 307.39 | 3020.16 | -2038.86 | 40.52 | -37.63 | 55.28 | 1.93 | 1.86 | 3.08 | |
| 85 | 3031.81 | 10.33 | 308.15 | 3029.70 | -2048.40 | 41.59 | -39.00 | 57.00 | 0.43 | 0.06 | 2.35 | |
| 86 | 3041.50 | 10.57 | 309.09 | 3039.23 | -2057.93 | 42.69 | -40.37 | 58.74 | 0.91 | 0.74 | 2.91 | |
| 87 | 3051.14 | 10.64 | 308.85 | 3048.70 | -2067.40 | 43.80 | -41.75 | 60.51 | 0.26 | 0.22 | 0.75 | |
| 88 | 3060.61 | 10.65 | 308.70 | 3058.01 | -2076.71 | 44.90 | -43.12 | 62.24 | 0.09 | 0.03 | 0.48 | |
| 89 | 3070.29 | 10.49 | 308.75 | 3067.52 | -2086.22 | 46.01 | -44.50 | 64.01 | 0.50 | 0.50 | 0.15 | |
| 90 | 3079.79 | 10.03 | 309.16 | 3076.87 | -2095.57 | 47.07 | -45.82 | 65.68 | 1.47 | 1.45 | 1.29 | |

IMG 9

Step 4: Navigate to the bottom of the drill file. Highlight at least one column in the last row (**IMG 9**) and click on the Proximity / Anti-collision Icon on the tool bar (or F5 on keyboard). The Proximity setup screen will appear (**IMG 10**). This setup screen automatically displays the first time you activate the proximity module.

Please ensure

- **(1) Select Reference Well** contains the Drill or Actual well
- **(2) Select Offset Well** contains the Plan well and anti-collision wells and these wells are highlighted
- Please note the **Start Depth** and **End Depth** contain the starting MD and ending MD of the range you selected in step 4. In this case only row 90 was selected so the start and end depths are the same (**IMG 10**)

Step 6: Select the **Settings** tab (**IMG 12**)

PathTracker Proximity Setup

Select Wells Settings More Data Messages Options

(1) Select Reference Well

Big Well 1 (Reference Well) Start Depth 3099.40 End Depth 3099.40

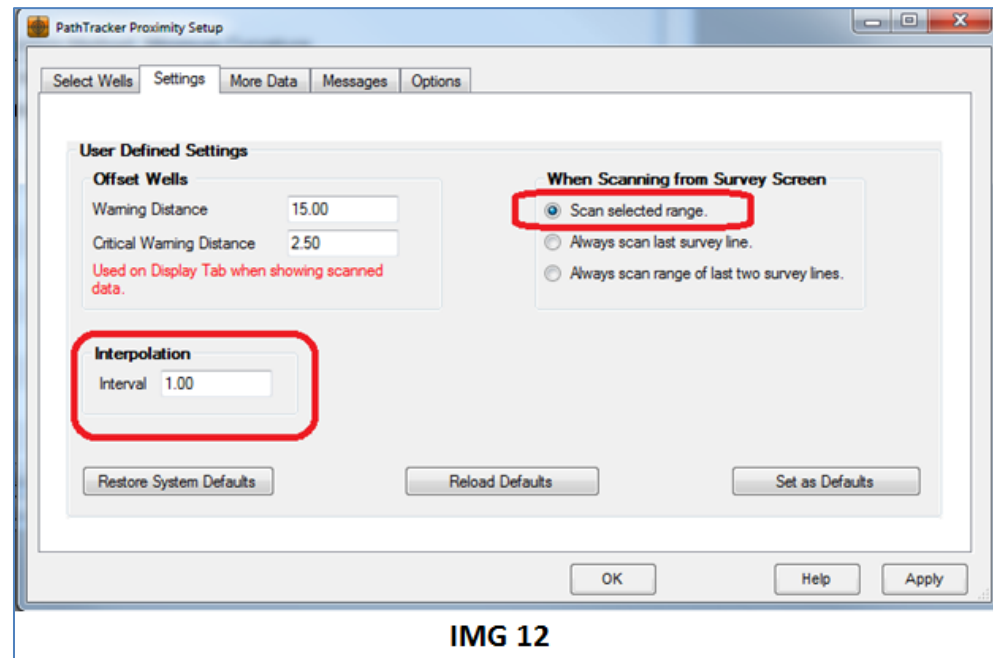
(2) Select Offset Wells

Big Well 2 (Existing Anti-collision well)
Big Well 1 (Plan)

Hold down ctrl or shift keys before clicking to select multiple wells

OK Help Apply

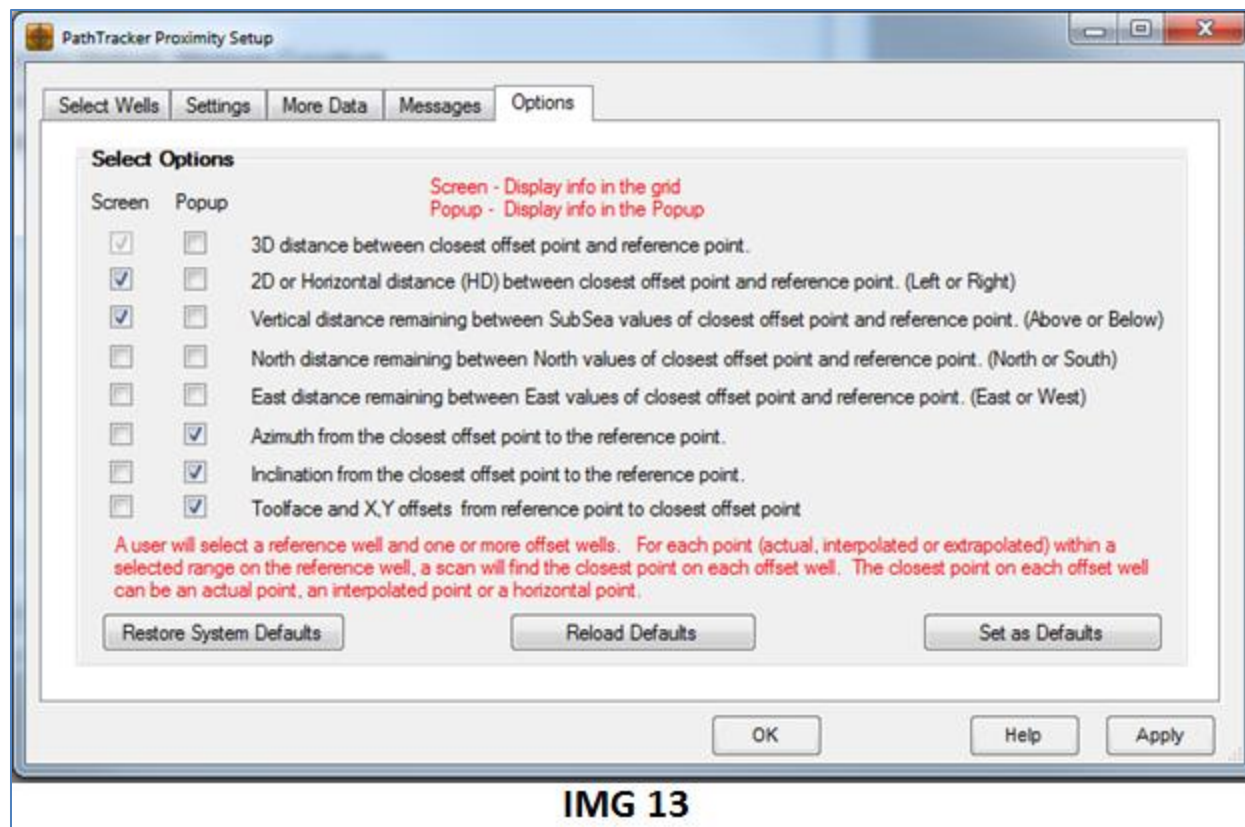
IMG 10



Please ensure

- **When Scanning from Survey Screen** has **Scan selected range** selected. This has to be chosen so you can scan a range by selecting one or more rows from the Reference well. The first and last highlighted rows will set the start and end depths for scanning.
- **Interpolation** value is set. As shown in IMG 6, an interpolation value of 1 will produce proximity numbers every 1 meter for a selected range scan. Increasing this number to 5 will result in calculating the proximity values every 5 meters for a given scan range.

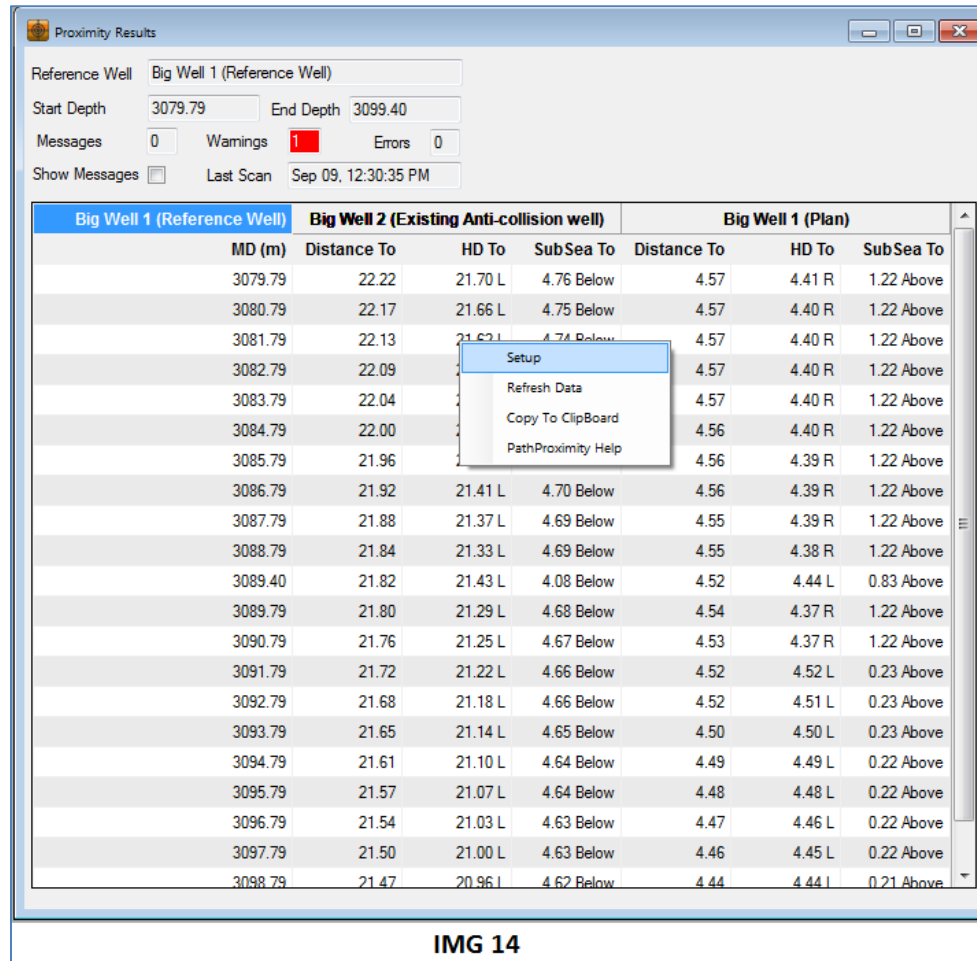
Step 7: Select the Options tab (IMG 13)



Use this screen (IMG 13) to select the proximity values you want to display in the proximity screen and proximity popup. These settings can be “Set as Defaults” so once configured, they are not required to be changed unless the user chooses to do so.

Step 8: Click OK

Step 9: The proximity setup screen can be modified anytime by right clicking on the Proximity Screen and selecting **Setup**. (IMG 14)



Proximity Results

Reference Well: Big Well 1 (Reference Well)

Start Depth: 3079.79 End Depth: 3099.40

Messages: 0 Warnings: 1 Errors: 0

Show Messages: ☐ Last Scan: Sep 09, 12:30:35 PM

| Big Well 1 (Reference Well) | | Big Well 2 (Existing Anti-collision well) | | Big Well 1 (Plan) | | |
|-----------------------------|-------------|---|------------|-------------------|--------|------------|
| MD (m) | Distance To | HD To | SubSea To | Distance To | HD To | SubSea To |
| 3079.79 | 22.22 | 21.70 L | 4.76 Below | 4.57 | 4.41 R | 1.22 Above |
| 3080.79 | 22.17 | 21.66 L | 4.75 Below | 4.57 | 4.40 R | 1.22 Above |
| 3081.79 | 22.13 | 21.62 L | 4.74 Below | 4.57 | 4.40 R | 1.22 Above |
| 3082.79 | 22.09 | 21.58 L | 4.73 Below | 4.57 | 4.40 R | 1.22 Above |
| 3083.79 | 22.04 | 21.54 L | 4.72 Below | 4.57 | 4.40 R | 1.22 Above |
| 3084.79 | 22.00 | 21.50 L | 4.71 Below | 4.56 | 4.40 R | 1.22 Above |
| 3085.79 | 21.96 | 21.46 L | 4.70 Below | 4.56 | 4.39 R | 1.22 Above |
| 3086.79 | 21.92 | 21.41 L | 4.70 Below | 4.56 | 4.39 R | 1.22 Above |
| 3087.79 | 21.88 | 21.37 L | 4.69 Below | 4.55 | 4.39 R | 1.22 Above |
| 3088.79 | 21.84 | 21.33 L | 4.69 Below | 4.55 | 4.38 R | 1.22 Above |
| 3089.40 | 21.82 | 21.43 L | 4.08 Below | 4.52 | 4.44 L | 0.83 Above |
| 3089.79 | 21.80 | 21.29 L | 4.68 Below | 4.54 | 4.37 R | 1.22 Above |
| 3090.79 | 21.76 | 21.25 L | 4.67 Below | 4.53 | 4.37 R | 1.22 Above |
| 3091.79 | 21.72 | 21.22 L | 4.66 Below | 4.52 | 4.52 L | 0.23 Above |
| 3092.79 | 21.68 | 21.18 L | 4.66 Below | 4.52 | 4.51 L | 0.23 Above |
| 3093.79 | 21.65 | 21.14 L | 4.65 Below | 4.50 | 4.50 L | 0.23 Above |
| 3094.79 | 21.61 | 21.10 L | 4.64 Below | 4.49 | 4.49 L | 0.22 Above |
| 3095.79 | 21.57 | 21.07 L | 4.64 Below | 4.48 | 4.48 L | 0.22 Above |
| 3096.79 | 21.54 | 21.03 L | 4.63 Below | 4.47 | 4.46 L | 0.22 Above |
| 3097.79 | 21.50 | 21.00 L | 4.63 Below | 4.46 | 4.45 L | 0.22 Above |
| 3098.79 | 21.47 | 20.96 L | 4.62 Below | 4.44 | 4.44 L | 0.21 Above |

IMG 14

To remove your name from our mailing list, please [click here](#)

Questions or comments E-mail us at customer.service@PathTracker.com or call 403-261-6662

Copyright ©1998-2014 1429275 Alberta Corp.

Please visit us at www.pathtracker.com for additional information.