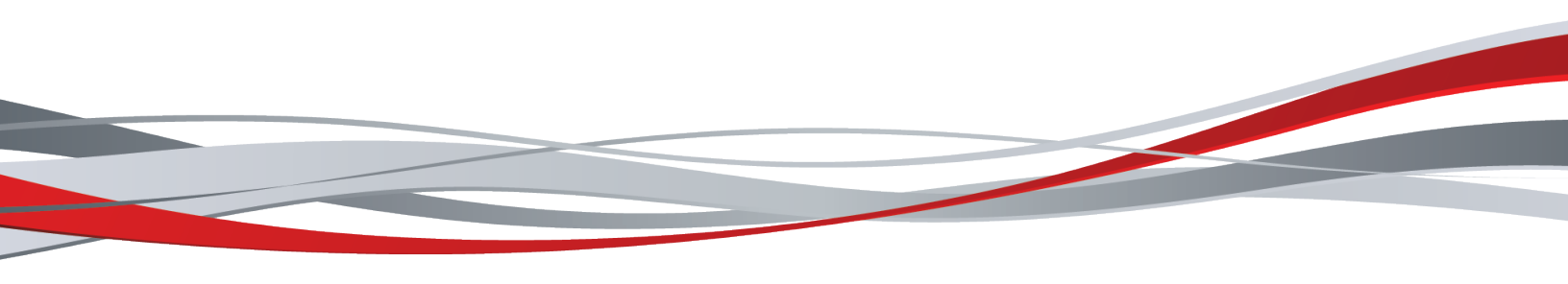# Differences Between V2 and V3 Outputs

🔥 Reports

- In PHDWin V2 to see data differently you must run different versions of a report in the Select and Run menu, for example Detailed NGL vs Detailed to see NGLs on a Detail report. In PHDWin V3 you run the Detailed report and then pick the 3 Volume option under Parameters after the report is run in the report window to see NGL streams in a Detailed report.
- In PHDWin V2 you can have only one report window open at a time. In PHDWin V3 you can run as many reports as they want and have multiple report windows open at the same time.
- Any report can be run directly to excel or PDF without first viewing the report in preview mode.
- Report runs can be saved in the SQL database for future reference. In V2 we overwrote the PHDWinOut.mdb with each report run.

🔥 Ownership Reversions

- In PHDWin V2 ownership reversions take place on the exact day, while in PHDWin V3 it occurs at the start of the following month as per SPEE recommendation practice #8.
- V2 two qualified ownership with partners. This is now done via the ownership qualifiers
- V3 ownership reversions now support carried interest and discounted values for payout calculations

🔥 The AsOf Date

- In PHDWin V2 both the discounting and the start of the economic calculation are tied to the AsOfDate. In PHDWin V3 that date has been broken down into an Eco Start Date, Discount Date and Report Date.
- Eco Start date is case specific or can be tied to a project date.
- Discount Date and Report Date are scenario controlled and do not include case specific options

🔥 Economic Limit Calculation

- In PHDWin V2 cases would be labeled non-economic when operating cash flow (LNRI Revenue minus 100% Opex - LNRI Taxes) went negative, while in PHDWin V3 the entire life is calculated as set in the scenario settings and then the date of maximum cumulative cashflow is picked as the ECL date.
- In V2, fixed costs are were converted to a daily cost in the last economic month of a case and as a result a lot of cases had economic limits in the middle of the month. In V3, monthly costs are assumed to be at a fixed rate that does not changed based on number of economic days in the month. This means that a case must cover all the monthly expenses by the end of the month to remain economic otherwise it will reach max cum cash flow at the beginning of the month. Most case in V3 will reach their economic limit at the first of the month.
- This adjustment in the interpretation of fixed costs resolves the February problem from V2. In V2, if a case went non-economic prior to October we would go back and adjust the fixed costs to be weighted by the # of days in the month. This led to some weird cash flows in the final year. We will no longer be making these adjustments in V3 so you may have some cases die in February that would have lived a short period longer in V2 but most will get through February because of max cum cash flow.

🔥 Economic Hurdles

- Economic hurdles are a new feature in V3 that will limit the reporting of a case as well as the cases inclusion in any group case economics or summaries based on whether the cases passes a series of economic hurdles. If a case fails to clear a hurdle it is marked as Non-Commercial and will be excluded from reporting, group economics, and summary values.
- The first economic hurdle is that the case must have a positive non-discounted cash flow. This is calculated as LNRI Revenue - 100% Opex - LNRI Taxes - 100% Capex.
- The second hurdle would be the case must have a positive discounted cash flow. Cash flow is calculated the same as the first hurdle and then discounted based on the scenario settings.
- The third hurdle would require a minimum ROI. This would require a minimum rate of return on the entered investments to exceed a particular value.

🔥 Non-Economic Group Cases

- Summary Plots
- Now able to summarize more than just volumes. Users can plot revenue and expenses as well.
- Stacked plots will be built by linking summary plots together in the incremental tree.
- Normalized Curves
- Now shows the constituent child cases historic and projected volumes as well as the normalized projection.
- Users can select to exclude individual or a selection of cases from the case and recalculate the normalized curve.
- More options on what we normalize on. In version 2 we only offered well count but now we offer lateral length and proppant.
- Lateral Length will calculate the average by dividing each child cases' production by their respective lateral lengths (in ft), taking the sum of all those values, then dividing by the total well count.
- Proppant will calculate the average by dividing the each child cases' production by their respective proppant amounts (in lbs), taking the sum of all those values, then dividing by the total well count
- Version 2 would always start normalization at first production but V3 will allow users to start normalizing at peak production.

🔥 Economic Group Cases

- Units, Platforms, Gas Plants, Ring Fence Units, and Income Tax Units will be replaced by Aggregate Units, Projection Units, Group Economic Limit (GEL) Units, and Allocation Units. The idea is that instead of having a lot of settings for user to select, they will pick the unit that accomplishes the task they want. Group ownership can now be a calculated value based on the working interest, revenue interest, royalty rate, and lease net revenue interest of the child cases. This will allow users to report costs at the group level or at allocate to the individual child cases and report the same total values.
- Aggregate Units - This unit will simply sum up the historic and projected volumes from the constituent child cases. Users will apply prices and expenses but will not project volumes into the future since those are gathered from the child cases. This

case will allow for well level projecting and engineering but all economics will be run at the group. The constituent child cases will not run economics and will not report.

- Projection Units - This unit will gather historical data from the constituent child cases. Users will apply prices and expenses and will project future volumes. The child cases will only provide historical data and will not run economics or report.
- Group Economic Limit (GEL) Unit - Replaces the standard unit from V2. The GEL unit will have fixed costs and/or capital costs but historical volumes and projected volumes will be gathered from the child cases. The child cases will control their own economics but the group will control the economic limit unless the child case would die early.
- Allocations Units - This unit will replace the platform from V2 but will have far fewer controls because the method and ratios used for allocations will be based on the type of expense being allocated and the economics of the project. This should simplify allocation group cases and make them more widely used.
- Fixed Costs should be the only costs applied at group cases. Variable costs should be on the child cases themselves to limit economic life of the child cases.
- Fixed Costs will be allocated to the constituent child cases based on their share of the working interest profit in the current month. If the current month does not have any working interest profit but has positive cumulative cash flow in the future, the fixed costs will be allocated on the constituent child cases share of the working interest profit in the future.
- Capital costs will be allocated based on the constituent child cases' share of future working interest profit. Those investment categories that are designated to report after the economic limit will use allocate the capex based on the total life working interest profit ratio of the constituent child cases.
- We will no longer support allocation to other group entities
- Nested GELS - Groups now support nesting group cases within group cases to have Nested GELs. Each group would control the maximum economic life of the included child cases. Each case would look to the parent group for the GEL Date. This will allow users to have an unlimited number of economic groupings for various expenses. For example, users could have well level costs on the well cases that are a part of a lease GEL case with lease level costs that is a part of a field GEL case that has field costs and those field cases are a part of another GEL case for company costs.
- This will also allow for better modeling of large offshore projects such as the Danish North Sea that had wells, satellite fields, platforms, and the project that all needed economic limits.

🔥 Price Escalations

- There is a small difference in how escalations are applied to a price between PHDWin V2 and V3. The following example illustrates that difference.

  If you run an escalation of 10% for 24 months for a base price of 3.35$

Year	V2 Price	V3 Price
1	$3.35\,(0.1) + 3.35 = 3.685$	$3.35\,(0.1) + 3.35 = 3.685$
2	$3.35\,(0.1) + 3.35 = 3.685$	$3.685\,(0.1) + 3.685 = 4.05$

If you run an escalation of 10% for 12 months and 20% for 12 months for a base price of 3.35$

Year	V2 Price	V3 Price
1	$3.35\,(0.1) + 3.35 = 3.685$	$3.35\,(0.1) + 3.35 = 3.685$
2	$3.685\,(0.2) + 3.685 = 4.42$	$3.35\,(0.2) + 3.35 = 4.02$

- There is a difference between prices when an escalated price goes above the cap price. In V3, if the price after being applied the differential is greater than the cap value, then the cap value will be the price used. In V2, if an escalated price goes above the cap price, then the cap price is used and the differential is applied to this value.

🔥 Graphs

- V2 was limited to 7 total graphs per case, 4 rate time and 3 rate cum, and this could not be changed. V3 can have any number of graphs and the x axis has more options such as Delta Time, Delta Time Squared, Square Root Delta Time, and Material Balance
- Normalized curve graphs will now show constituent wells that make the normalized curve. Users can select individual wells on the graph and see the values or delete the well from the normalized curve calculation
- Now capable of seeing recompletion projections on the child cases.
- Users can see all the way back the entire incremental branch rather than just being able to see back one.

🔥 Projections

- Now able to project gross and net values for volumes, revenue, and expenses whereas in V2 you could only project Gross values and you could not see revenue or expenses
- Altered the conversion from Vol/day projections to Vol/month to use a more precise value of 30.4375 days in a month to convert daily to monthly ARPs parameters. This value is determined by taking 365.25 to account for leap years and dividing by 12. In version 2 we simply divided 365 by 12. This small difference will result in different volume projections between V2 and V3 with V3 having slightly lower values. The differences are most noticeable when projections are flat.
- Projections for individual products can now be copied between cases
- More projection options such as Scheduled, SEDM, and Flat projections.
- Projection types are not fixed. A user can project each segment using a different projection type
- Minor phase flat phase configurations will have their fixed variable converted to a flat projection that goes from eco start date and is locked to the major phase. This conversion may require some prior work on the users' part in V2 if their formula has too many parameters.

◇ Investments

- V2 qualified via partners but is now controlled by the ownership qualifier
- Supports carried interest via the Custom Working Int option that will adjust the net value reported for the investment to the percentage entered.
- Carried interest values are qualified by the intersection of the ownership and the investment qualifiers.

◇ Depreciation

- Both tangible and intangible portions of investments can be depreciated. Only tangible could be depreciated in V2.
- The same investment can be depreciated in different ways for different purposes such as accounting vs income tax

◇ Daily Production Data

- V3 now has a dedicated table for daily production volumes and these can be plotted on the graph. Daily data is just for reference on the graph and is not used for economic calculations.

◇ ID Codes

- V2 ID codes are managed on a case level, in V3 they are managed by its own window at the database level.