

**Incorporating detailed production activities  
in a short-term plan using Deswik and  
Datamine software to improve the  
compliance to plan.**

*Case study of underground mine by Senior Planner*

# Introduction

A Gold mine realized that the compliance to the three-month rolling plan tonnes and grade was poor after each quarter.

After analysis, it was found that the day-by-day plan was not matching with the plan from Datamine Studio 5D and EPS.

The disconnection between the actual and the plan was due to:

- In the Studio 5D planner production drill meters is a calculated task based on the planned stopes tonnes and a constant drill factor but when designing the long hole drill pattern, the burden, spacing, drill factor depend on ground condition, stope minable shape and geotechnical parameters.
- Grade applied in the project was average block model grade, but when mining is the blast-by-blast grade which is applied by production geologist (with grade variability taken into consideration and paste dilution from adjacent paste filled stopes).

Decision was made to consider the designed production drill meters from Drill and Blast Engineers, each single blast tonnes and grade and thereafter to incorporate it in the software (Studio 5D planner) and schedule so that to reflect the real picture when mining at the daily basis as each blast solid will reflect his real grade and tonnes assigned.

The case study covers generating detailed production plan using both Deswik software and Datamine Studio 5D planner.

# Methodology using Datamine Studio 5D

Run the projected with calculated prod drill meters and calculated sch grade (Studio 5D planner and exported in EPS)

Convert to subtasks the parent stope activities in EPS

Create subtasks based on splits quantity of each blast tonnes in EPS and assign manually the grade of each subtask in EPS based on geologist grade.

The process should be done for each stope.

Assign the designed prod drill meters and designed cable bolt meters.

Assign the attributes to the subtasks solids (M4DESC, SEGMENT, M4DNUM)

Combine the new solids with the project solid so that EPS read the new subtasks in EPS InTouch.

Subtask the drill parent activity if the stope require UH and DH

Start rescheduling based on the detailed activities keeping budget figures as a guide line

The screenshot displays the Datamine Studio 5D interface. On the left, a 3D model shows a mine plan with various stopes and drill holes. The main window is divided into several panels:

- Task List:** A table listing tasks with columns for ID, Name, Description, Start, and End. The list includes tasks like 'C\_420\_STP\_22\_2nd\_LIR', 'C\_278\_STO\_26\_B#5B\_floor\_stock', and 'C\_385\_STO\_30\_B#1'.
- Convert to Subtasks Dialog:** A dialog box is open, showing the 'Convert to Subtasks' process. It includes fields for 'Task ID', 'Task name', 'Task duration', and 'Current Quantity'. There are checkboxes for 'Create Finish-Start links between subtasks' and 'Roll-up sub-tasks onto the summary row'.
- Gantt Chart:** A Gantt chart on the right shows the project schedule from June to August 2021, with bars representing task durations and dependencies.
- Summary Table:** A table at the bottom right shows summary data for the project, including 'Total Ore (t)', 'Total Grade (g/t)', and 'Total Ounces (Oz)'.

Task ID	Name	Description	Start	End
SB0608001	C_420_STP_22_2nd_LIR	STP_BLKHD	July	
SP0608001	C_420_FIL_22_2nd_LIR	FILL_PRI	July	
S_0608001.2013449	C_278_STO_26_B#5B_floor_stock	STOPE	May	June
SL0698001	C_385_SLO_30	SLOT_PASTE_CUT	June	June
SC0698001.9927492	C_385_STP_30_PREP_CHG_B#Raise			
SC0698001.9927493	C_385_STP_30_PREP_CHG_B#1			
SC0698001.9927494	C_385_STP_30_PREP_CHG_B#2			
SC0698001.9927495	C_385_STP_30_PREP_CHG_B#3			
S_0698001.8605048	C_385_STO_30_Raise			
S_0698001.8605049	C_385_STO_30_B#1			
S_0698001.8605050	C_385_STO_30_B#2			
S_0698001.8605051	C_385_STO_30_B#3			
SD0698001.8896283	C_385_STP_30_B1_down_holes			
SD0698001.8896284	C_385_STP_30_R_B1&B2_up_holes			
SH0698001.9917320	C_385_CB_30			
SH0698001.9917321	C_385_CB_30			
SB06982001	C_385_STP_21			

# Methodology using Deswik

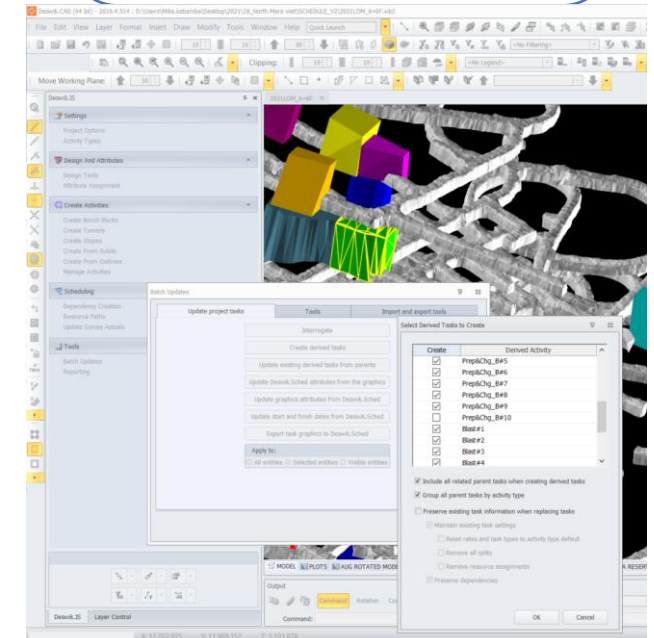
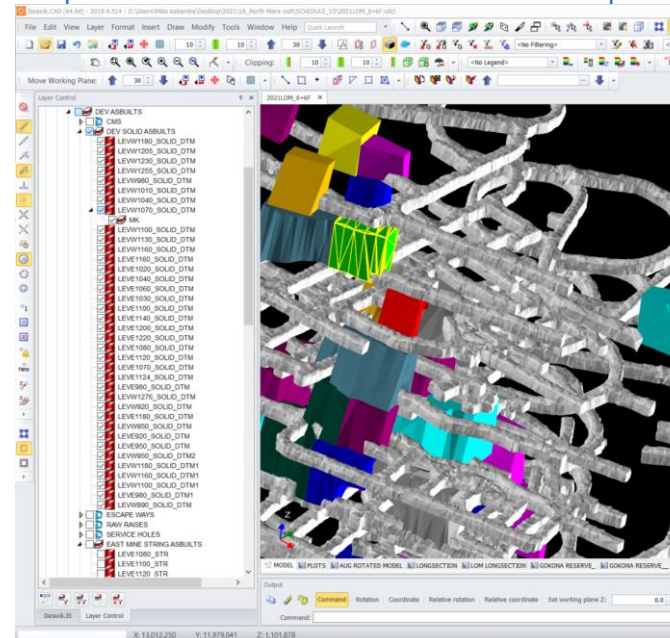
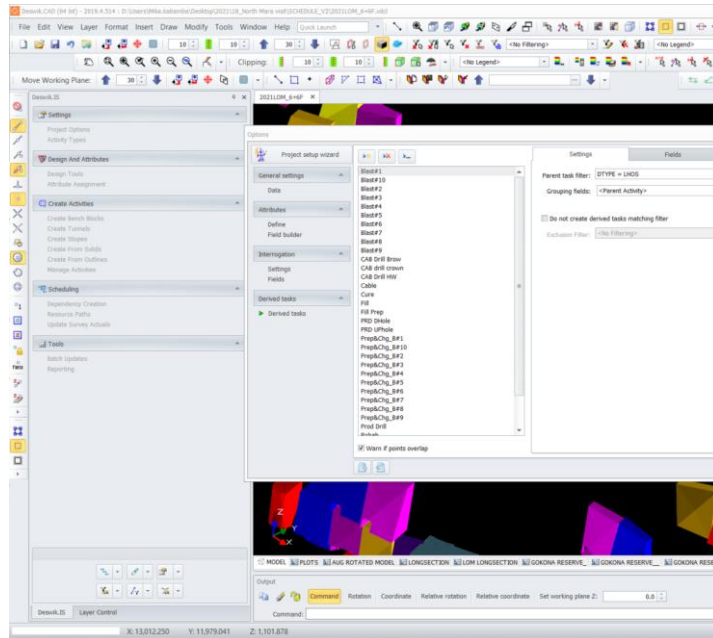
Run the Deswik project with calculated prod drill meters and calculated sch grade (Deswik CAD and exported in Deswik Scheduler and Deswik IS)

Based on the Deswik project set up subtask does not work the same way with EPS where you can just select the task as a subtask it

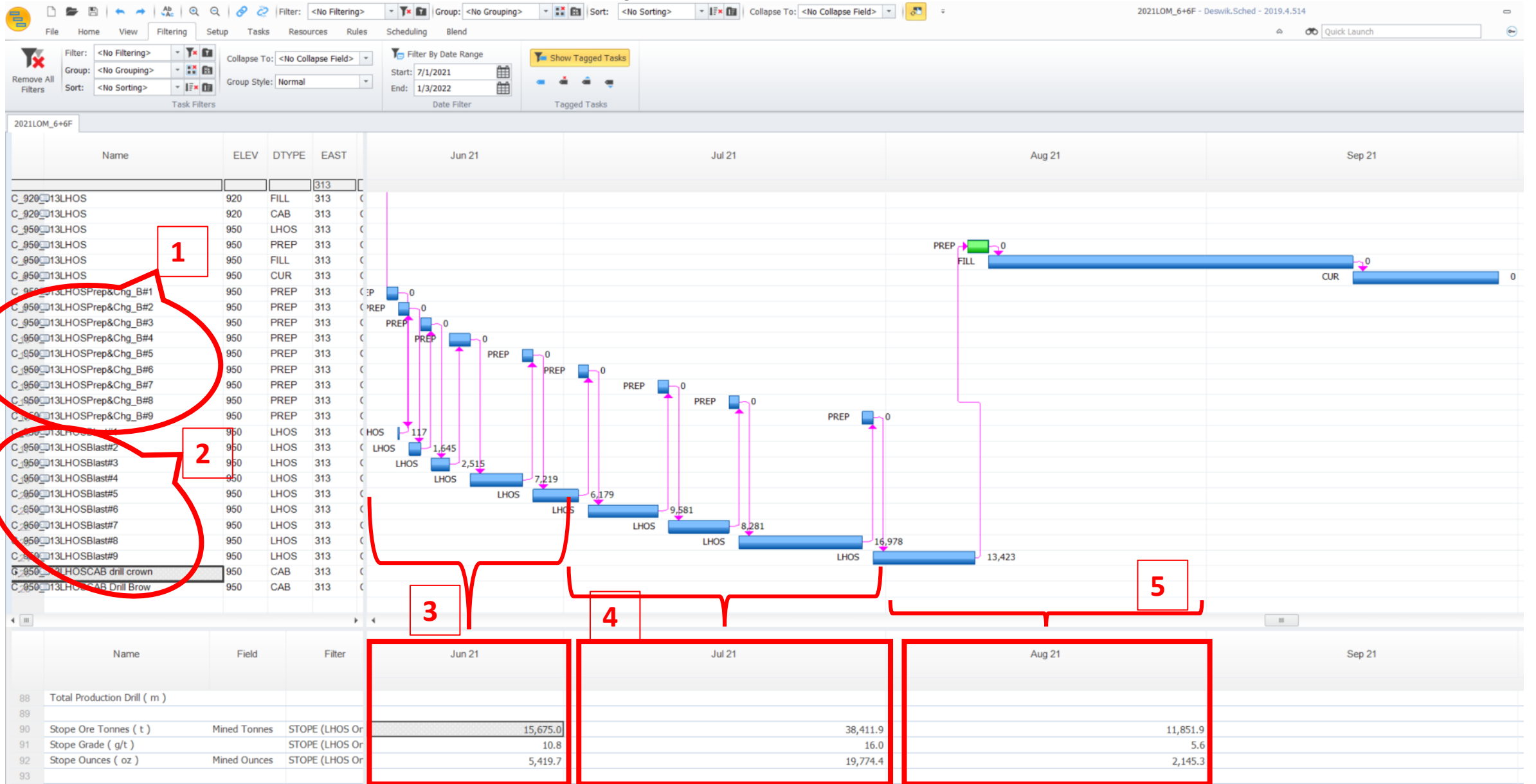
In Deswik CAD, you should go to Deswik.IS→Settings→ Project options →Derived tasks→ add all tasks you aim to be derived from the parent task(LHOS)→Parent task filter: no filtering for prep and charge derived task→ this allow to not auto calculate the duration→Blast parent filter=DTYPE=LHOS\_to allow to get the Ounces calculation in account→press OK

Select the stope solid for which you aim to add derived tasks(drill\_HU,drill\_DH,prep,charge,blast,grade)

After stope selection→ Deswik CAD→ Deswik.IS→ Tools→ Batch Updates → Create derived tasks→ Select Derived Tasks to Created→ tick the tasks you want→ press OK→ to go Deswik scheduler and all the derived tasks will appear and the scheduling job can start after creating derived tasks for all your 3 month stopes.



# Results and Analysis



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1. on slide number(5), it shows on circle(1) how the prep and charge tasks are split based on the stopes blast by blast solid provided by drill and blast Engineer while on the long term project it shows just one charge task like all stopes are taken in one shot.
2. On circle(2) it shows how the stopes tonnes are split as per the blast by blast solid tonnes provided by Drill and blast Engineer, each blast has got its own grade assigned by production geologist.
3. On (3) it shows the monthly stopes tonnes and grade of the Stope(E 950\_313) based on the schedule of June Month plan.
4. On (4) and (5) it shows the respectively the grade and tonnes scheduled for July and August Monthly plans

In this short term plan all the stopes activities (long drill meters, cable bolter meters, stope prep and charging time, blasting day) are split and assigned based on the actual designed figures.

This detailed assignment should be done for all stope planned within 3 month plan.

# Conclusion

- The difference should be seen between a long-term plan(Budget) and the short-term plan project(3-month plan).

In the long term plan the activities are calculated, i.e. the long hole drill meters for a stope is taking in account the stope strike, the mining sequence and the drill factor which is a constant in the global constant in the project set up but in the short term the Drill factor can change from a stope to an other one based on the technical aspect on the field(required fragmentations, adjacent stopes over or under break, paste fill exposition), if the stope will be mined in 3 month , its grade will not be the stope block model average grade as it is the case in the long term plan, but the grade should reflect the reality of the blast. At the end of the stope life the total grade will be reconciled with the total stope grade but when mining at the daily basis it should show the daily mined grade, this help every body to monitor the feed plan grade on the daily basis.

- In the long-term plan, the long hole drill is just one activity which shows the start and finish day while in short term, the same stope can technically require for up and down holes, and in some case when running short of free mucking ore, the stope can be blasted just after finish drilling the up hole(regarding the firing sequence) and the down hole will be drilled after when there is flexibility, or when mucking underneath(if it is safe to do so). All of these details cannot be shown on the long-term plan because it shows high resolution activities and tasks but on the short-term plan, it is the plan of details to allow the productions guys ( foreman, shift boss) to get all details in order to achieve the plan and to have a good compliance to plan.
- The short-term project gives more flexibility to the short-term planning Engineer to get more scenarios of his plan and less time.

When comparing the 2 software, it was observed that the results are the same, but Deswik offers more flexibility as Deswik.IS links the planning gap between designing and scheduling. One can create and update planning activities graphically, and your Gantt chart will be updated automatically, and conversely. This facilitates rapid schedule development, giving you time to analyze scenarios, but Studio 5D planner has got a weakness of re-running the all project when even a position of a development design was changed or a new stope was added, when you re-run the project, you will lose some links that lead you to waste time to re link again.

# Recommendations

- The Budget plan should always be considered as guidance but the short-term plan in Deswik project should contain all the required detailed activities and should be updated each month.



# References and Bibliography

- ❑ <https://www.deswik.com/product-detail/interactive-scheduler-module/>
- ❑ <https://www.dataminesoftware.com/studio-5d-planner-update/>

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