CEE 536 Term Project: The Woodstock Sawmill Case
(Individual work only. Students work on this assignment alone.)

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Due: Tuesday, November 11, 2025

Suppose that you are Mr. Warren Ellis, project manager for the Woodstock Sawmill. Your job is to make sure that the project is constructed on time and on budget. The project started on Monday, 6-Oct-2025. Today is Saturday, 28-Feb-2026. Read the details of the case and prepare *your report of professional quality* according to the following guidelines:

1. Prepare an activity list. Put the activities in sequence-step order. Prepare a precedence network.

2. Compute the early and late activity times and the total and free floats for each activity. Show the results on the network, as well as in an activity table. Your table should show the activities grouped in the three major categories described in the case. It should also include a column that shows all known activity costs.

3. Prepare a time-scaled precedence network and indicate on it the current status of the project. This could be a Gantt chart from MS Project or P6, or a Visualizer TSLD.

4. Prepare a target S-curve (BCWS) based on the early schedule. Determine the BCWS, ACWP, and BCWP values as of the data date. Calculate the cost variance (CV), and schedule variance (SV). Determine SV in weeks as well as in dollars.

5. Discuss the status of the project in terms of time and cost. What are the causes of delay and cost overruns—are they serious?

6. Mr. Ellis states that he "... *was determined to stick as closely as possible to his original estimates. He was particularly concerned about cost expenditures during the sawmill construction phase because of the contract provision for weekly payments*." Are these concerns valid? What would your concerns be? Explain.

7. Suggest corrective actions and state your reasoning. Consider what happens if the project is either early or late. How much would you spend to shorten the project? Be as thorough and professional as you can. (The time-scaled network should be very helpful.)

8. Your report should be concise and to the point. Be sure to focus on the important facts. Support your recommendations with tables and networks.

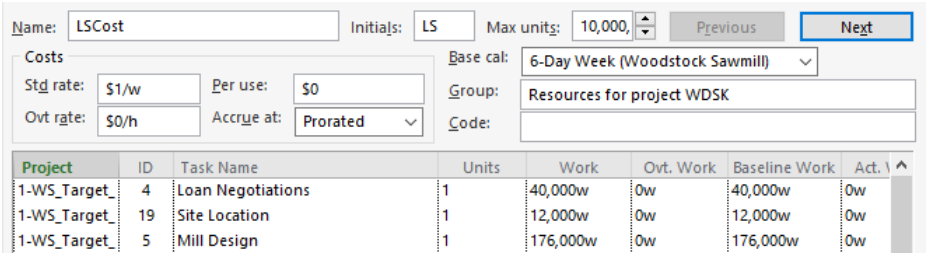
9. You can do this project by hand. You may also use *Excel*. You may also use s*cheduling software* (such as P6, MS Project, etc.). Or you may use any convenient *combination* of tools. If something can be done better or easier by hand or by computer, then do it that way. The choice of tools is up to each student. However, substandard work is not acceptable.

Questions and answers for the Woodstock Sawmill project.

Q: What is the best way to add costs to activities in MS Project (or Primavera P6 Pro)?

A: In general, define a "Work (Labor) Resource" called $U whose cost is $1/w. To each activity, allocate as many units/week of $U as the $/week of the cost of the activity. The total resource units and cost of $U allocated to each activity gives the total direct cost of the activity in $.

Alternatively, the MS Project template for the Woodstock Sawmill already defines a Work Resource called LSCost (similar to $U) whose cost is $1/w (LSCost stands for Lump-Sum Cost). First, allocate 1 unit of LSCost to each activity. Then, enter the Work amount for LSCost to match the total cost for each activity in $. (Note that each activity will still be assigned 1 unit of LSCost. See the screen shot from MS Project below.) This approach assigns to each activity a lump sum of money given by the field Work (which matches the field Cost) and eliminates the need to divide the total cost of each activity by its duration to get units per week. Thus, it avoids having non-integer Work and Cost numbers with repeating decimals, such as xxxx.33333.



Project	ID	Task Name	Units	Work	Ovt. Work	Baseline Work	Act.
1-WS_Target_	4	Loan Negotiations	1	40,000w	0w	40,000w	0w
1-WS_Target_	19	Site Location	1	12,000w	0w	12,000w	0w
1-WS_Target_	5	Mill Design	1	176,000w	0w	176,000w	0w

Q: Should we add the indirect cost to activities and to the S-curves?

A: No. Do not add indirect costs to activities nor to the S-curves. Indirect costs are tracked separately because they are not "directly" associated with the "activity work scheduled" or the "activity work performed". That is why they are considered "indirect" costs to the activities.

Q: How do we find the "actual costs" of the activities that have been performed?

A: The case gives the budgeted cost for each activity (that can be used for BCWS and BCWP).

To estimate the ACWP for the activities that has been performed, multiply their BCWP by a ratio (that is easy to calculate) so that the sum of all ACWP (for the activities that have been performed) equals the total actual cost as of the Data Date given in the case. (How is project control affected, if the individual ACWP are approximations, and not exact, but their sum equals the given total actual cost as of the Data Date?) Describe and document what you have done.

Q: Which method should we use to calculate Earned Value and BCWP?

A: For this project, there are no activities in progress at the Data Date, so the question of which method to use to measure Earned Value for activities in progress (and thus the BCWP for all work performed) does not arise.

If it had, the appropriate method for most activities would have been by calculating "% Complete based on Duration" as calculated by MS Project:

$$\%complete = 1 - \frac{(Remaining\ Duration)}{(Actual\ Duration + Remaining\ Duration)}$$
$$= \frac{(Actual\ Duration)}{(Actual\ Duration\ +\ Remaining\ Duration)}$$

Q: Some activities specify that they are to be paid for upon completion. Does this imply that the activities that do not have this stipulation must be paid for when the activity begins?

A: Project Control does not use the "cash method of accounting" which tracks revenues and expenses based on the receiving and payment of cash. The tracking of cash is used for "cash flow analysis" to ensure that payment obligations can be met in cash when they are due.
Project Control (i.e., BCWS, ACWP, BCWP, CV, SV) uses the "accrual method of accounting" which measures "the continuous creation of the obligation to pay" and the "continuous earning of value". Thus, the "obligation to pay" should be spread evenly over the duration of the corresponding activity that creates the obligation to pay.
For example, the cost of $3,252,000 should be spread over the 24-week duration for the "Delivery of Chinese machinery". Similarly, the cost of $1,620,000 for the "Delivery of local equipment" should be spread over the 8-week duration of that activity. And the $120,000 for the construction of the rail spur should be spread over its duration of 12 weeks.

Q. For the contracted activities, are their weekly payments due at the beginning of the week or the end of the week?

A: This question also relates to the actual payment of cash. The timing of cash payments matters only for *cash flow analysis* (to make sure that enough cash is available so that checks do not bounce). For Project Control we concentrate on the obligation to pay and spread that over the corresponding activity as described above.

Q: In the third part of the Woodstock Sawmill case, i.e., "Construction of Sawmill", there are three phases: the "concrete phase", the "steel-work phase" and the "final machine installation phase". We are given the cost of each phase, but not the cost of the individual activities in each phase. How do we allocate the cost of each phase to its individual activities?

A: Exercise your judgment as to how to distribute the cost of each phase to its more detailed activities.
These costs occur in the future, so the method you choose to distribute the combined costs of each phase to its activities affects only the shape and smoothness of the BCWS curve (to show the smooth earning of value without abrupt jumps). Make sure you document your assumptions.

Q: How should the milestone "M" in the next-to-the-last bullet be modeled?

A: Model milestone "M as a dummy activity with zero duration that has several predecessor activities and several successor activities. Its purpose is to minimize the required number of precedence links from preceding to succeeding activities and to make the network easier to read.

Q: I have made some assumptions. What should I do?
A: It is OK to make reasonable assumptions. But always document all steps and assumptions so that someone else (including yourself later) can follow your work.