

Work Performance Management



Introduction

Work Performance Management (WPM) is a methodology that has been developed by Mosaic Project Services Pty Ltd to reliably calculate the expected project completion date and schedule variance on all types of project. It offers a simple, robust solution to the challenges of providing rigorous project controls information on projects that cannot (or are not) using the more traditional controls paradigms of critical path scheduling (CPM) and/or earned value management (EVM). **WPM is not intended as a replacement for either CPM or EVM on large, complex projects.**

The purpose of this document is to provide guidance on applying the WPM methodology using the Excel **Easy WPM Workbook**.

The WPM methodology and the contents of the papers below are available for use and adaptation under a Creative Commons 3.0 License. However, the workbook and the WPM Logo are both © copyright of Mosaic Project Services Pty Ltd and ™ trademarked.

General information on WPM spreadsheet

When using the spreadsheet please note:

- The spreadsheets and workbook are protected to ensure the calculations perform as intended
- Data Entry is only allowed in the fields with a White fill
- The date format used is DD-MMM-YY (15-May-23)

The required sequence of working is (more details are in the referenced sections below):

1. Complete the project set up at the top of the Master sheet. This information is required for the calculations. All fields other than the Data Date are needed to set up the project, when complete, the red WARNING is no longer shown – see **Setting up your project**.
2. Develop the Work Planned baseline using the project units defined in the set up – see **Entering Work Planned (WP) data**. This baseline should not change.
3. Enter the Work Accomplished through to Time Now. Set the Data Date on the Master sheet at the day the progress information was gathered, then enter the totals achieved on the time periods before Time Now - see **Entering Work Accomplished (WA) data**.
4. Provided the required data is entered correctly, all calculations are performed automatically, the results are displayed on the Master sheet, a pre-formatted report is available for printing on the Report tab – see **Results and calculations**. The spreadsheets contain extensive error checking, warnings appear when errors are detected.
5. Variations in the scope of work can be accommodated in both the WP and WA data – see the respective sections.



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

WPM terms and definitions

The terminology used for the data points in WPM is:

- **WP = Work Planned** The quantity of work planned to be achieved per *Duration Unit*, measured in the defined *Units of Measure*
- **WA = Work Accomplished** The quantity of work accomplished in each *Duration Unit*, measured in the defined *Units of Measure*
- **PC = Planned Completion** The number of *Duration Units* between the project's start and end, expressed as working days, weeks, or months
- **TN = Time Now** The number of *PC* time units from the *Project Start Date* to the current *Data Date*
- **TE = Time Earned** The number of *PC* time units the *Project Start Date* to the point where *WA* is equal to the *WP*.

From this information, the work performance measures are calculated as follows:

- **WPV = Work Performed Variance** The number of *Duration Units* the work is ahead, or behind, plan as at the *Data Date*, calculated as $TE - TN$, negative values show the project is running behind plan
- **WPI = Work Performed Index** The ratio between *Time Now* and *Time Earned*, calculated as TE/TN , values less than 1.0 show less work has been accomplished than planned
- **EC = Expected Completion** The expected project duration in *Duration Units* calculated by $PC/WPI = EC$
- **VAC = Variance At Completion** The variance at completion in *Duration Units* calculated by $PC - EC$, negative values show the schedule slip
- **Expected Completion Date** The calendar date the project is expected to complete, calculated by adjusting the *Project End Date* by the *VAC*.

General information and data structure entries are:

- **Project Name** A freeform text field for the project's name
- **Duration Units** The time unit used on the project, selected from: Days, Weeks, Months
- **Work Days Per Week** The number of working days in each week, this is used to calculate the completion date
- **Project Start Date** The calendar date the project starts, the beginning of the first *Duration Unit*
- **Project End Date** The calendar date the project finishes, the end of the last *Duration Unit* (this should be updated to reflect variations)
- **Units of Measure** A freeform text field to describe the unit of measure (metric) used to quantify the work planned and accomplished
- **Data Date** The calendar date at which work performance is measured, the last *Duration Unit* within *Time Now*



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

Setting up your project

The project set up at the top of the Master sheet is required to be complete before the entry of other data and for the correct performance of the automatic calculations used in the WPM spreadsheet. **All fields are required**, when complete, the relevant red **WARNING** is no longer shown.

<p>Work Performance Management</p>	Project Name	<input type="text" value="Type Project Name"/>	<p>WARNINGS</p> <p>Entire Project Name</p> <p>Duration Unit Required</p> <p>Working Days Per Week Required</p> <p>Project Start and End Dates Required</p> <p>Describe your Unit Of Measure</p>	
	Duration Units	<input type="text" value="Select Unit"/>		Note: Minor differences between the data and date based calculations for PC are to be expected. See 'Instructions' Tab.
	Work Days Per Week	<input type="text" value="Select Number"/>		
	Project Start Date <small>UK / Australia Date Format</small>	<input type="text"/>		PC (Data) =
	Project End Date	<input type="text"/>		PC (Dates) =
	Units of Measure	<input type="text" value="Type your unit of measure"/>		
	Data Date	<input type="text"/>		Time Now =
Results:				

Project Name – replace the pre-loaded text with an appropriate project name, this is used across the spreadsheets and in the reports.

Duration Units - the spreadsheet is set up to calculate either 60 Months (5 years), 60 weeks or 60 days. Select your preferred time unit for the work periods from the pull-down list, replacing 'Select Unit' with either: Months, Weeks, or Days.

Work Days Per Week - Select the number of working days per week from the pull-down list. Replace 'Select Number' with your choice of 4, 5, 6 or 7 working days per week.

Project Start and End Dates. Start and end dates are required for the calculations. Date format in this version of the spreadsheet is DD/MMM/YY (15-May-23).

Units of Measure - describes the way work is measured. This can be any unit of your choosing from \$ Dollars, through 'Story Points', to the work outputs being counted – see below.

The project set up at the top of the Master sheet is now complete, and the aligned red **WARNINGS** are no longer shown.

<p>Work Performance Management</p>	Project Name	<input type="text" value="Telstra Pit Replacement"/>	<p>WARNINGS</p> <p>Entire Project Name</p> <p>Duration Unit Required</p> <p>Working Days Per Week Required</p> <p>Project Start and End Dates Required</p> <p>Describe your Unit Of Measure</p>	
	Duration Units	<input type="text" value="Weeks"/>		Note: Minor differences between the data and date based calculations for PC are to be expected. See 'Instructions' Tab.
	Work Days Per Week	<input type="text" value="5"/>		
	Project Start Date <small>Date Format used DD-MMM-YY</small>	<input type="text" value="01-May-23"/>		PC (Data) =
	Project End Date	<input type="text" value="28-Jul-23"/>		PC (Dates) = 12.71 Weeks
	Units of Measure	<input type="text" value="Pits Installed"/>		
	Data Date	<input type="text"/>		Time Now =

Note: All of the warnings need to be removed and Work Accomplished data added before the worksheet will calculate results.



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

WPM units of work

The core element in developing an effective WPM system is defining a robust measure of the work involved in the project. This needs to be a unit that can be applied uniformly across the core work of the project.

The measure does not need to include everything. In the *Telstra Pits* sample spreadsheet, cost items such as procurement, the overall management of the project, and the disposal of hazardous materials are not captured in the metric of 'Pits Installed'. However, problems in any of these areas are likely to have an immediate impact on the progress of the team delivering the core measure, or in the case of the waste disposal are unlikely to be critical. WPM is not a cost management system it is focused on measuring the progress of work that directly affects completion, based on an impartial measure to assess the quantum of work planned and achieved.

Some of the options for effective measures of work include:

- **Direct measures** where the project's output can be counted are useful for many straightforward projects:
 - Telecom pits installed
 - Computers replaced
 - Interviews conducted
- **Measures that describe the amount of effort** applied to accomplish each component of the work, the estimate of the amount of effort involved in each unit of measure needs to be consistently applied across the project (eg, every story point involves the same amount of work):
 - Function points
 - Stories and story points
 - Activity days from the schedule
 - Hrs of effort (Note: for this measure the WA is based on the planned hours per component completed, not the timesheet record of hours actually worked)
- **Monetary values (\$)**, this metric is particularly useful for commercial projects where a planned cashflow is established, and then monthly claims submitted to the client based on a schedule of rates for the work completed – care is needed to make sure the WP and WA remain aligned.

The key to obtaining valuable information from a WPM analysis is selecting a robust metric, ideally one that is used in other aspects of the project¹.

Care is needed to avoid confusing activity with work! For example, in software development the output from a sprint is variable, a sprint is timeboxed, and the team may produce nothing (everything goes back into the backlog) or a lot of finished work, it depends on circumstances. Whereas, *function points*, or *story points* describe an amount of work that is embedded in the product. A story that has 6 story points is expected to take twice as much effort to deliver as a story with only 3 story points. When a story is delivered at the end of a sprint, the work involved in accomplishing its story points has been completed.

¹ For more on **selecting the unit of work** see:
https://mosaicprojects.com.au/Mag_Articles/AA037_-_Overview_of_WPM.pdf (page 3)



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

Entering Work Planned (WP) data

The Work Planned is the foundation of the WPM calculations, enter the number of units of work planned to be produced in each work period. The values entered are the *Units of Measure* established during the project set up.

The syntax of the text displayed on this spreadsheet changes to reflect the information entered during project set-up. In this case we are counting the planned number of **pits installed** each **week** on the **Telstra Pit Replacement** project (this information is carried forward from the Master sheet set-up).

PERFORMANCE		Work Planned: Telstra Pit Replacement										
		Establish your Baseline for Worked Planned at the start of the project (this should not change). The values entered are per Weeks Between 1 and 14 line items can be entered to establish the plan. Descriptions of the work can be included in the first column. Variations to the planned baseline can be added in the 'Variation' section below.										
		The work units for this project are: Pits Installed										
		Planned Completion (PC) = 1										
	Weeks No.	1	2	3	4	5	6	7	8	9	10	11
	Include in PC Count	1										
	Pits Installed Cumulative	0										
	Total Pits Installed per Weeks	0	0	0	0	0	0	0	0	0	0	0
Baseline Work Planned:												
	Total Allocated	0										
		0										

To establish the baseline, you need to enter the number of units of work planned to be produced in each work period using the *Units of Measure* established during the project set up. If no measurable work is planned for the week, entre zero (0). Between 1 and 14 line-items can be entered to establish the plan - at least one set of data is needed to clear the red **WARNING** on the Master sheet. Descriptions of the work can be included in the first column.

Weeks No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Include in PC Count	1	1	1	1	1	1	1	1	1	1	1	1	1
Pits Installed Cumulative	0	0	11	32	53	74	95	116	137	158	179	200	200
Total Pits Installed per Weeks	0	0	11	21	21	21	21	21	21	21	21	21	0
Baseline Work Planned:													
	Total Allocated	0	0	0									
	Project start-up	0	0	0									
	Install Replacement Pits	200			11	21	21	21	21	21	21	21	
	Project Finalisation	0											0
		n											

In this example, we have entered three lines of data, The project start-up with no pits planned to be installed, the work of replacing 200 pits and the project finalization with zero pits to install.

The spreadsheet has 60 columns for work period and a split screen to allow scrolling. This example is expected to run for 13 weeks.

The total *Units of Measure* assigned against each line item are totaled to facilitate reconciliation with the plan for the project.

Each column that has either a numeric value, or a zero (0), in one of its cells is automatically included in the PC count. The PC count from this data input is used on the WPM calculations.

You can validate the WP baseline is aligned with the project plan on the Master sheet – the number of work periods between the project start and finish dates can be compared to the PC duration derived from the data input to the WP spreadsheet. Minor differences are to be expected, this



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

project finished on a Friday, but the start date is a Monday, so the end of the 13th full week finishes on the Sunday.

Project Start Date Date Format used DD-MMM-YY	01-May-23	PC (Data) = 13 Weeks
Project End Date	28-Jul-23	PC (Dates) = 12.71 Weeks

The baseline for Worked Planned is set at the start of the project and should not change.

The Importance of Zero (0)

The Planned Completion (PC) duration is central to the calculations embedded in WPM. But, with a system focused on the core work of the project there are likely to be work periods where no deliverables are expected. These may include:

- The project set-up period
- Planned holiday periods (eg, Easter or Christmas)
- The project finalization, testing, bug fixing, etc.

If the project is still running but no production planned in these time periods, enter a zero (0) in one of the cells. The zero can be in a separate line item defining the period, or simply inserted in the row defining the primary work.

Managing variations

The baseline for Worked Planned is set at the start of the project and should not change. However, change is inevitable, and actively invited in projects employing an agile approach to the work. When a variation is included in the WP, the planned work is immediately incorporated into the WPM calculations.

Variations to the planned baseline can be added in the 'Variation' section in the lower part of the spreadsheet. There is provision for 14 separate variations. As with the baseline work, the planned production should be entered into the appropriate work period, if necessary, extending the PC duration.



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

4. Enter the Work Accomplished (WA) and the WPM workbook does the rest

Performance Management		Time Now (TN) = 5				Time Earned (TE) = 3.9048		
Weeks No.		1	2	3	4	5	6	7
Include in TN Count		1	1	1	1	1		
Pits Installed Cumulative		0	0	5	15	30		
Total Pits Installed per Weeks		0	0	5	10	15	0	0
Baseline Work Accomplished:	Total Recorded							
Project start-up	0							
Install Replacement Pits	30			5	10	15		
Project Finalisation	0							
	0							

As with the PC dates, minor differences between the calendar-based calculation and the work periods in the spreadsheet are to be expected. The information shown indicates the Work Accomplished is being recorded towards the end of Week 5 (Friday) which is correct.

There is no need for non-measured activity to be entered, but you may choose to record the weeks worked if the information is of value:

Performance Management		Time Now (TN) = 5				Time Earned (TE) = 3.9048		
Weeks No.		1	2	3	4	5	6	7
Include in TN Count		1	1	1	1	1		
Pits Installed Cumulative		0	0	5	15	30		
Total Pits Installed per Weeks		0	0	5	10	15	0	0
Baseline Work Accomplished:	Total Recorded							
Project start-up	0	0	0	0	0			
Install Replacement Pits	30			5	10	15		
Project Finalisation	0							
	0							

In this case, the project start-up can be seen to have taken 4 weeks compared to the 2 weeks planned. What is important is the slow start has been reflected in the low production rates for pits installed in weeks 3 through 5. In the period through to Time Now, 30 pits have been installed, but 53 were planned to be complete at the end of week 5.

An underlying assumption in WPM is that provided the right *Unit of Measure* has been chosen, poor performance in supporting activities will be reflected in the measure, simplifying the overall controls process.

If the total Work Accomplished against a line item exceeds the total Work Planned, an error is flagged with a red highlight:



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

Work Performance Management		The work units for this project are: Pits Installed							
		Error - Over allocation of WA - See red highlight							
		Time Now (TN) =				5	Time Earned (TE) =		3.9048
Weeks No.		1	2	3	4	5	6	7	
Include in TN Count		1	1	1	1	1			
Pits Installed Cumulative		0	0	5	15	30			
Total Pits Installed per Weeks		0	0	5	10	15	0	0	
Baseline Work Accomplished:									
	Total Recorded								
Project start-up	5	0	0	0	0	5			
Install Replacement Pits	25			5	10	10			
Project Finalisation	0								

In this case the installation of 5 pits has been recorded against the 'Project start-up' work item, where no pits were planned (all 200 were against the 'Install Replacement Pits' work item). The error message is repeated on the Master sheet:

Results:		Error - Over allocation of WA - See red highlight on WA sheet	
Planned Completion	14 Weeks		
Time Now	5 Weeks	Telstra Pit Replacement	

Managing variations

Work Accomplished against a Variation must be entered in the 'Variation' section in the lower part of the screen. As with the baseline work, the variations should be copied forward from the WP spreadsheet.

Results and calculations

The Calculations are automatic and occur as data is entered. Complete all of the input as at the *Data Date* before using the results:

Results:		
Planned Completion	14 Weeks	
Time Now	5 Weeks	
Time Earned	3.9048 Weeks	
Work Performance Variance	-1.0952 Weeks (-5.5 Working Days)	
Work Performance Index	0.7809524	
Expected Completion	17.9268 Weeks	
Variance At Completion	-3.9268 Weeks (-27.5 Calendar Days)	
Expected Completion Date	03-Sep-23	
Note: This date is an approximation, WPM does not include a detailed calendar.		



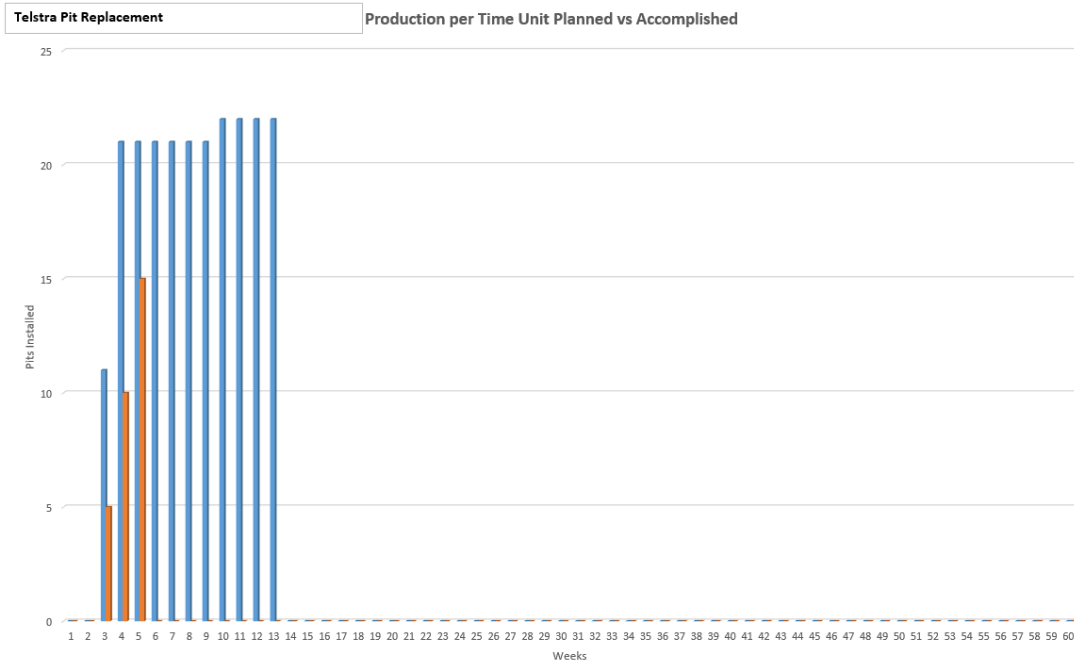
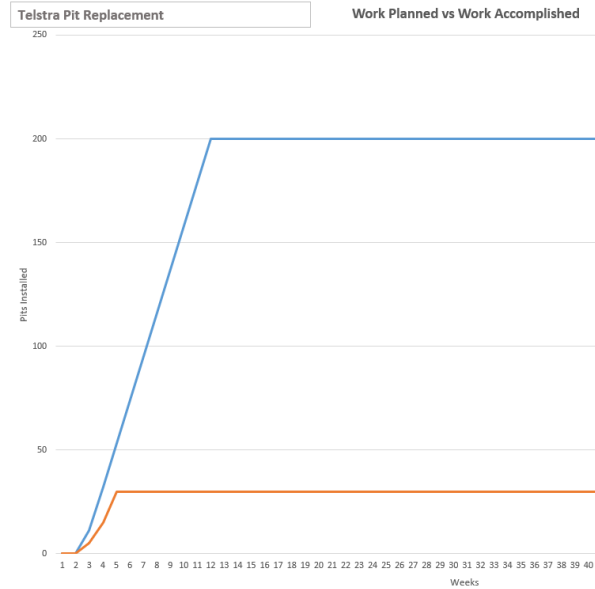
Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

The definition and basis of calculation for each of these outputs are included in the **WPM terms and definitions** section above.

The system also generates two graphs. A cumulative performance graph, and a production graph showing the planned and actual performance in each time unit. Both graphs extend for the 60 time units of the spreadsheet.

The planned data is represented by the blue line, the actual data by the orange line.



WPM Outputs

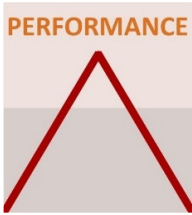
The primary output from the WPM system is the report shown at near full size on the following page. This report will fit on a standard 'Letter' or A4 page.



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

Support and feedback



The WPM methodology has been crafted to help organizations achieve **peak performance** from their project teams by providing a simple robust tool focused on measuring the overall schedule performance of each project.

The adage *you cannot manage what you cannot measure* is particularly true when it comes to the measurement of progress and the related decision making needed to deliver agile and distributed projects on time.

To support the objective of peak performance, the following resources are available:

A section of the Mosaic website dedicated to WPM, current and future papers will be published at:
<https://mosaicprojects.com.au/PMKI-SCH-041.php>

To recommend enhancements to the spreadsheet and obtain support and advice on its use you are welcome to email the developer: patw@mosaicprojects.com.au

To purchase copies of the spreadsheet and download free resources see:
https://mosaicprojects.com.au/shop-easy-WPM_WS.php

Standard WPM printed report:



Work Performance Management

Guidance on applying the methodology using the *Easy WPM Workbook*.

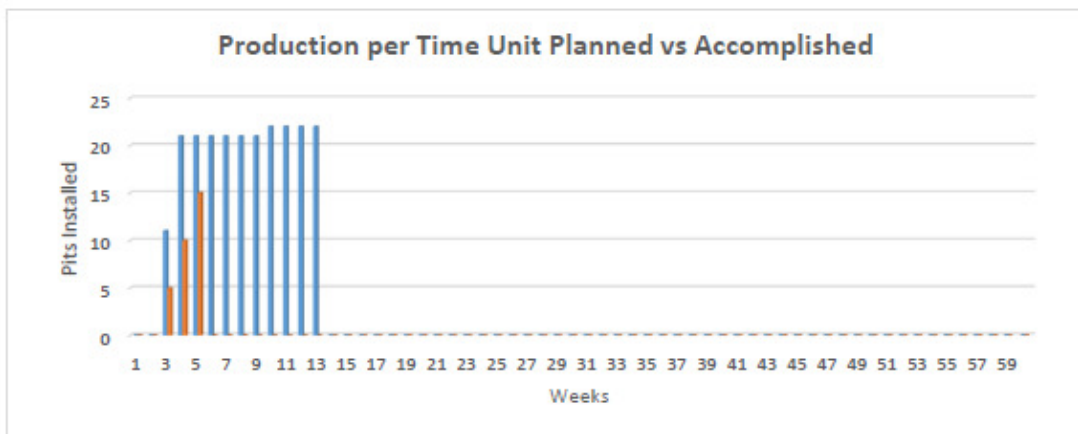
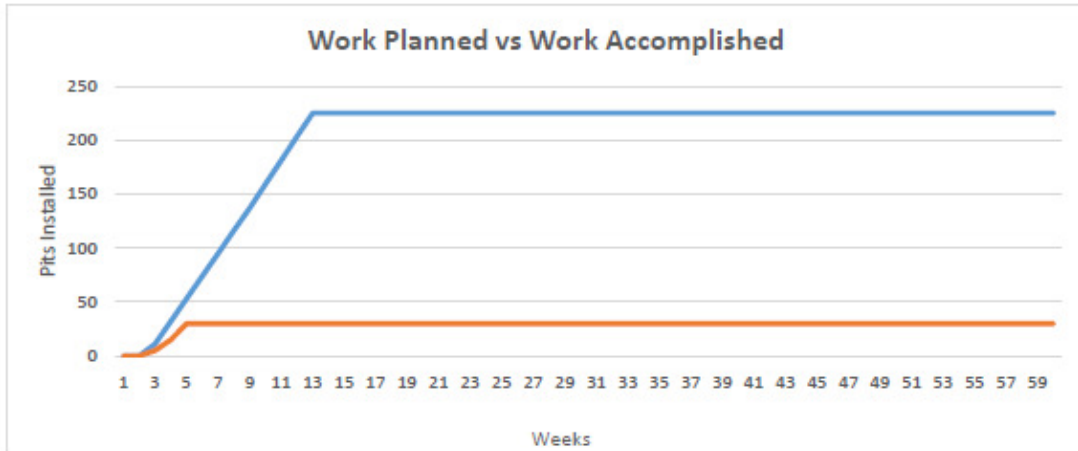


Telstra Pit Replacement

Time Now = 02-Jun-23

Planned Completion	14 Weeks	
Time Now	5 Weeks	
Time Earned	3.9048 Weeks	
Work Performance Variance	-1.0952 Weeks	(-5.5 Working Days)
Work Performance Index	0.7810	
Expected Completion	17.9268 Weeks	
Variance At Completion	-3.9268 Weeks	(-27.5 Calendar Days)
Expected Completion Date	03-Sep-23	

Note: This date is an approximation, WPM does not include a detailed calendar.





Work Performance Management

Guidance on applying the methodology using the *Easy WPM* Workbook.

Papers in the WPM series:

1. **WPM Overview:** [https://mosaicprojects.com.au/Mag_Articles/AA037 -
_Overview_of_WPM.pdf](https://mosaicprojects.com.au/Mag_Articles/AA037_-_Overview_of_WPM.pdf)
2. **How WPM Works:** [https://mosaicprojects.com.au/Mag_Articles/AA038 -
_How_WPM_Works.pdf](https://mosaicprojects.com.au/Mag_Articles/AA038_-_How_WPM_Works.pdf)
3. **WPM solves CPM optimism:**
[https://mosaicprojects.com.au/Mag_Articles/AA039 - WPM solves CPM optimism.pdf](https://mosaicprojects.com.au/Mag_Articles/AA039_-_WPM_solves_CPM_optimism.pdf)
4. **WPM for Agile Projects:**
[https://mosaicprojects.com.au/Mag_Articles/AA040 - WPM for Agile Projects.pdf](https://mosaicprojects.com.au/Mag_Articles/AA040_-_WPM_for_Agile_Projects.pdf)
5. **WPM for Lean & Distributed Projects:**
[https://mosaicprojects.com.au/Mag_Articles/AA041 - WPM for Lean + Distributed Projects.pdf](https://mosaicprojects.com.au/Mag_Articles/AA041_-_WPM_for_Lean_+_Distributed_Projects.pdf)