



CONTRACT NO. STW 01/2021

**ENVIRONMENTAL TEAM FOR RELOCATION OF
SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS –
SITE PREPARATION AND ACCESS TUNNEL CONSTRUCTION**

UNDER ENVIRONMENTAL PERMIT NO. EP-533/2017/A

**BASELINE AIR QUALITY MONITORING REPORT FOR
THE ROCK PROCESSING PLANT AT NGAU KOK WAN
(REVISION B)**

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DATE:

28 October 2022



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Executive Summary

- i. This Baseline Monitoring Report is to report baseline findings for the Project of Rock Processing Plant for handling excavated rocks from the construction of the Sha Tin Cavern Sewage Treatment Plant.
- ii. Baseline air quality monitoring was conducted at one (1) designated air quality monitoring station for consecutive 14 days prior to the commencement of construction works.
- iii. This report presents the findings and information of baseline air quality monitoring during the period from 15 July 2022 to 28 July 2022. No construction activities under the Project were undertaken during the baseline monitoring period.

Air Quality Monitoring

- iv. Air quality monitoring was conducted and recorded in terms of 1-hour Total Suspended Particulates (TSP) for 14 consecutive days. The Action Level for 1-hr TSP was established at one (1) air quality monitoring stations based on the measured baseline TSP levels. Action & Limit levels of 1-hour TSP levels were summarized as shown in **Table I**.

Table I Summary of Action & Limit Levels of Baseline 1-hour TSP Levels

Monitoring Station	1-hour TSP Level	
	Action Level (µg/m ³)	Limit Level (µg/m ³)
ASR51 – The Hongkong Yaumati Ferry Company Ltd. Administrative Building	310	500

1 Introduction

1.1 Background

1.1.1. During the construction of the Sha Tin Cavern Sewage Treatment Plant, large amount of rocks were expected to be excavated, if those rocks could be further processed to suitable sizes, not only it can provide a valuable source of aggregate for other construction projects in Hong Kong, but also to reduce the burden of the public fill facilities as they are running out of capacity. Therefore, it was proposed to construct a rock processing facility at Ngau Kok Wan to handle the excavated rocks from the cavern project.

1.1.2. The Project mainly comprises the following works:

- (i) Construction of two sets of rock processing facilities, each consists of vibrating feeder, crusher and vibrating screens.
- (ii) Construction of barging point with conveyor facilities.
- (iii) Minor site formation works for the stockpiling area.

1.2 Purpose of Baseline Monitoring Report

1.2.1. Baseline monitoring is to review baseline conditions of air quality along the Project boundary, and to establish baseline levels for air quality in accordance with the EM&A Manual. These levels would be used as the basis for assessing environmental impact and compliance during construction stage of the Project.

1.2.2. This baseline monitoring report presents baseline monitoring requirements, methodologies, monitoring results and determination of Action and Limit levels for each monitoring parameter at one (1) designated air quality monitoring station as described in the Environmental Review Report (ERR) for the Rock Processing Facility.

2 Air Quality Monitoring

2.1 Monitoring Requirements

2.1.1 In accordance with the Project EM&A Manual, baseline 1-hour TSP levels should be established by conducting baseline 1-hour TSP monitoring for at least consecutive 14 days prior to the commencement of the construction work. At least 3 sets of 1-hour TSP data shall be collected every day.

2.1.2 The baseline air quality monitoring at one (1) monitoring stations was conducted during the baseline monitoring period from 15 July 2022 to 28 July 2022 and the relevant findings are summarized in this report. The baseline monitoring schedule is shown in **Appendix A**.

2.2 Monitoring Equipment

2.2.1 1-hour TSP air quality monitoring was performed by using portable direct reading dust meter, which was previously proposed by the ETL (Ref: *LES/J2019-02/CS/L018 dated 23 May 2019*), verified by IEC (Ref: *EC/TC/BW/bw/T407129/Correspondence/L016 dated 23 May 2019*), and approved by the Director of Environmental Protection (Ref: *(20) in EP2/N1/F54 Pt.5 dated 28 May 2019*), at the designated monitoring station, according to Section 2.2.5 of the Project EM&A Manual. The brand and model of the equipment are given in **Table 2.1**.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and model	Series Number	Calibration Date	Calibration Due
Portable direct reading dust meter	Met One AEROCET 831	Y23154	24/1/2022	23/1/2023

2.2.2 Comparison check with High Volume Sampler of the air quality monitoring equipment listed in **Table 2.1** can be referred to **Appendix C**.

2.3 Monitoring Locations

2.3.1 Details of the air quality monitoring station are presented in in **Table 2.2** and shown in **Figure 2.1**.

Table 2.2 Baseline Air Quality Monitoring Stations Location

Monitoring Station	Air Sensitive Receivers	Monitoring Location
ASR51	The Hongkong Yaumati Ferry Company Ltd. Administrative Building	Ground Floor

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 The monitoring parameters, frequency and duration of air quality monitoring are summarized in **Table 2.3**.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Period	Duration	Sampling Parameter	Frequency
Baseline Monitoring	At least 14 consecutive days prior to the commissioning of the construction works	1-hour TSP	3 times per day

2.5 Monitoring Methodology

2.5.1 1-hour Measuring Procedures

- (a) Check the calibration period of portable direct reading dust meter prior to monitoring (The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly, details refer to Section 2.5.4)
- (b) Record the site condition near / around the monitoring stations.
- (c) Install the portable direct reading dust meter to the monitoring location.
- (d) Slide the power switch to turn the power on.
- (e) Check of portable direct reading dust meter to ensure the equipment operation in normal condition.
- (f) Select the period of measurement to 60mins.
- (g) Check and set the correct time.
- (h) Select the appropriate unit display for the equipment.
- (i) Slide the power switch to turn the power off when the monitoring period ended (3 times 1 hour TSP monitoring per day).
- (j) Uninstall the portable direct reading dust meter
- (k) Collected the sampled data for analysis.

Remark: Procedures (c) to (h) may be different subject to the brands and models of portable direct reading dust.

2.5.2 Maintenance and Calibration

- (a) The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly to determine the accuracy and validity of the results measured.
- (b) Checking of direct reading dust meter will be carried out in order to determine the conversion factor between the direct reading dust meter and the standard equipment, HVS. The comparison check is to be considered valid based on correlation coefficient checked by HOKLAS laboratory

2.5.3 Wind data

The representative wind data from Tsing Yi HKO Automatic Weather Station was obtained covering the 1-hr TSP monitoring periods. The wind data were extracted and shown in

Appendix C.

2.6 Results and Observations

- 2.6.1 Baseline 1-hour TSP monitoring was carried out from 15 July 2022 to 28 July 2022 for consecutive 14 days and the weather were **mostly sunny**. Major dust source was from the operation of the cement plant next to the designated monitoring station.
- 2.6.2 The results for 1-hour TSP are summarized in **Table 2.4** respectively. Detailed air quality monitoring results are presented in **Appendix E**.

Table 2.4 Summary of 1-hour TSP Baseline Monitoring Results

Parameter	Monitoring Station	Average (µg/m ³)	Range (µg/m ³)
1-hour TSP Level	ASR51	91.6	22.1 – 235.1

2.7 Action and Limit Levels

- 2.7.1 Action and Limit Levels for air quality impact monitoring was based on the criteria adopted from the EM&A Manual as presented in **Table 2.5**.

Table 2.5 Derivation of Action and Limit Levels for Air Quality

Parameters	Action Level	Limit Level
1-hour TSP Level in µg/m ³	For baseline level ≤ 384 µg/m ³ , Action level = (baseline level * 1.3 + Limit level)/2; For baseline level > 384µg/m ³ , Action level = Limit level	500 µg/m ³

- 2.7.2 By using the averaged-baseline level retrieved from the baseline monitoring data as presented in **Table 2.4**, and the formula for deriving the Action Level as presented in **Table 2.5**, the derived Action and Limit levels are presented in **Table 2.6**.

Table 2.6 Derived Action and Limit Levels for Air Quality

Parameter	Monitoring Station	Action Level (µg/m ³)	Limit Level (µg/m ³)
1-hour TSP Level	ASR51	310	500



3 Revisions for inclusion in the EM&A Manual

3.1.1 The baseline air quality monitoring (i.e. 1-hr TSP level) was already conducted in accordance with Section 2.2.5 of the Updated EM&A Manual.

3.1.2 No revisions for inclusion in the Updated EM&A Manual were considered necessary.

4 Comments, Recommendations and Conclusions

Comments and Recommendations

Air Quality

- 4.1.1 Baseline air quality monitoring was conducted during typical Hong Kong wet season. The baseline data collected therefore represent baseline air quality of the wet season immediately prior to commencement of the Project. It is therefore recommended that the baseline conditions should be reviewed every three months at each monitoring location when no dusty works activities are in operation, as such the influence of seasonal changes can be taken into account for the interpretation of the air quality monitoring data.

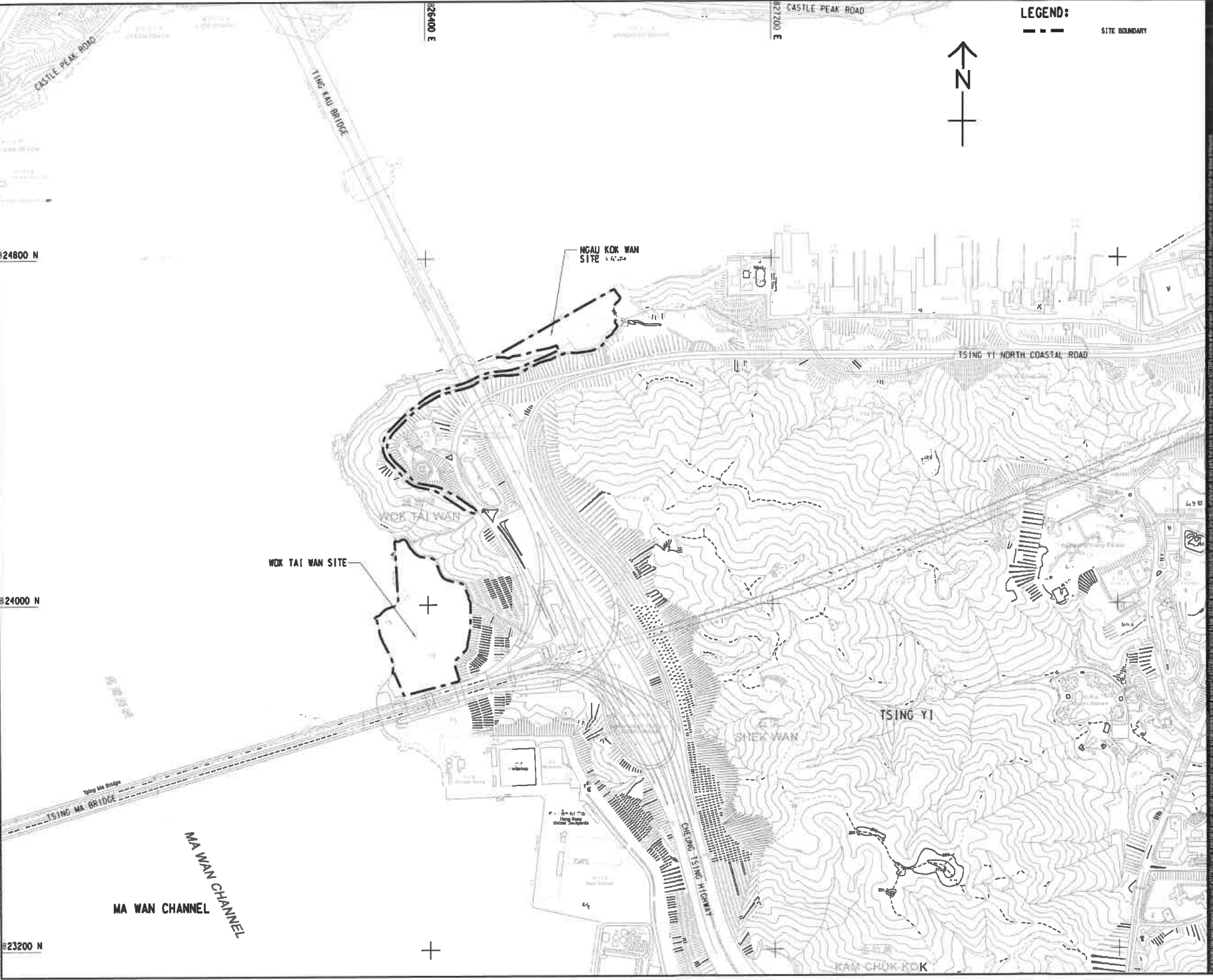
Conclusion

- 4.1.2 In accordance with the Project EM&A Manual and EP, baseline monitoring has been undertaken prior to commencement of the construction works of the Contract for the following baseline monitoring component: Air Quality.
- 4.1.3 Baseline air quality monitoring was conducted at one (1) monitoring locations from 15 July 2022 to 28 July 2022. Overall, the baseline air quality monitoring results were considered representative to the ambient air quality conditions of the respective sensitive receivers. Action and Limit Levels for air quality of 1-hour TSP levels were established based on the baseline monitoring results.



Figure 1.1
Location of Project Site

BOD AT 8/10/2015 8:44 from
 Approved
 Checked
 Designed
 Project Management Initials: 24800 N
 24000 N
 24000 N
 23200 N
 Plot File by: Chan
 22 October 2010
 C:\Users\chan\Documents\PROJECTS\TSING MA\005-STRUCAD\PRODUCT\CONSTR\WIDESPREAD\CONSTR.DWG



LEGEND:
 --- SITE BOUNDARY

AECOM

PROJECT
 RELOCATION OF
 SHA TIN SEWAGE
 TREATMENT WORKS
 TO CAVERNS

CLIENT
 Drainage Services Department

CONSULTANT
 AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK

STATUS

SCALE
 A1:4000
DIMENSION UNIT
 METRES

KEY PLAN

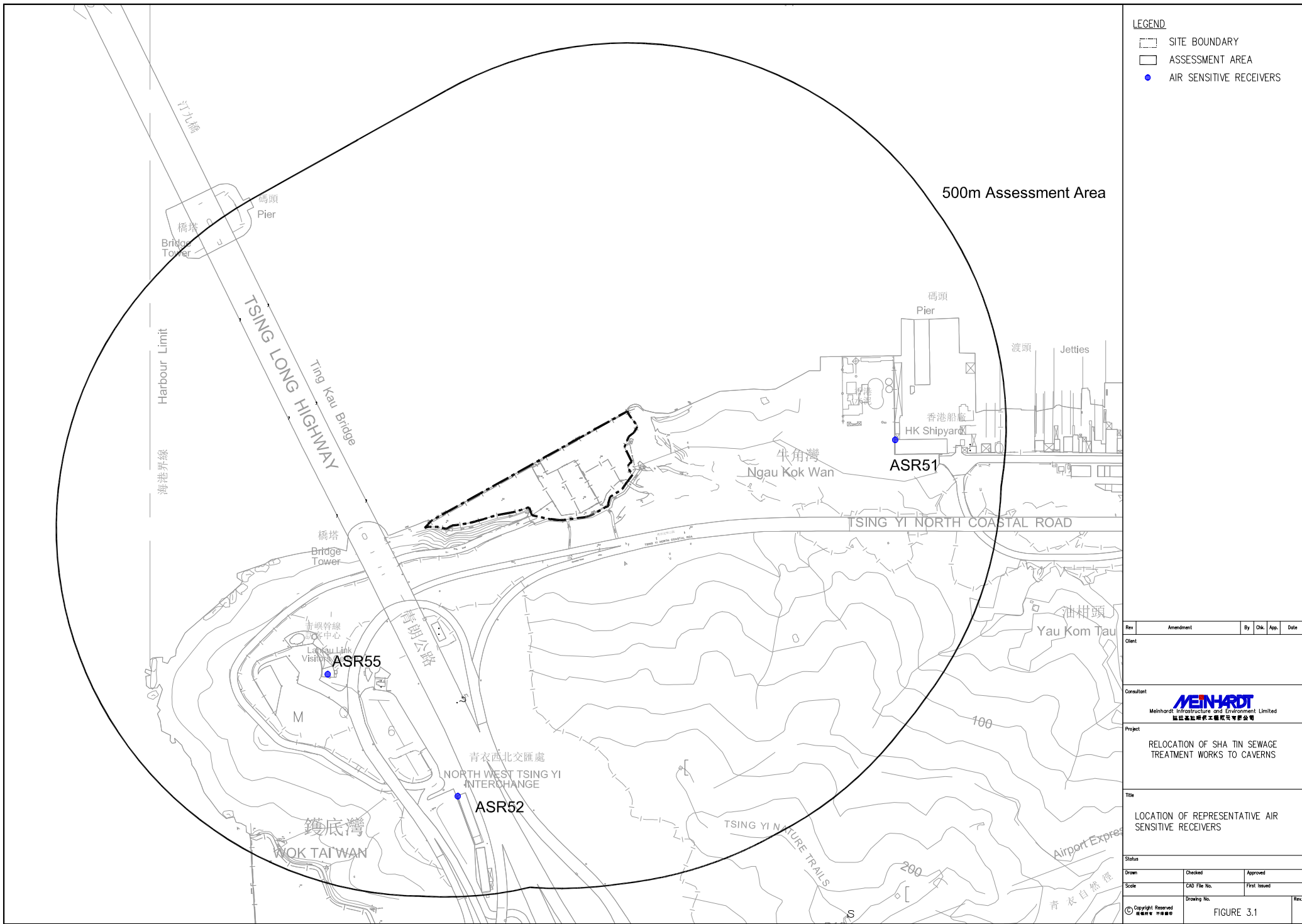
PROJECT NO.
 60334056
CONTRACT NO.

SHEET TITLE
 LOCATION OF WOK TAI WAN AND
 NGAU KOK WAN

SHEET NUMBER
 Figure 1



Figure 2.1
Location of Air Quality Monitoring Station



- LEGEND**
- ▭ SITE BOUNDARY
 - ▭ ASSESSMENT AREA
 - AIR SENSITIVE RECEIVERS

500m Assessment Area

Rev	Amendment	By	Chk.	App.	Date

Client

Consultant
MEINHARDT
 Meinhardt Infrastructure and Environment Limited
 福益基設施工程顧問有限公司

Project
 RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS

Title
 LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

Drawn	Checked	Approved
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Scale	CAD File No.	First Issued
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Drawing No.	Rev.
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FIGURE 3.1



General View



Surrounding Environment



Surrounding Environment



Location of the monitoring station



Appendix A
Baseline Monitoring Schedule for
Air Quality Monitoring



Contract No. STW 01/2021
 Environmental Team for Relocation of Sha Tin Sewage
 Treatment Works to Caverns –Site Preparation and Access Tunnel Construction
 Tentative Environmental Baseline Monitoring Schedule
 Jul 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					01 Jul	02 Jul
03 Jul	04 Jul	05 Jul	06 Jul	07 Jul	08 Jul	09 Jul
10 Jul	11 Jul	12 Jul	13 Jul	14 Jul	15 Jul	16 Jul
					1 hr TSP	1 hr TSP
17 Jul	18 Jul	19 Jul	20 Jul	21 Jul	22 Jul	23 Jul
1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP
24 Jul	25 Jul	26 Jul	27 Jul	28 Jul	29 Jul	30 Jul
1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP	1 hr TSP		
31-Jul						



Lam Environmental Services Limited

Contract No. STW 01/2021
Environmental Team for Relocation of
Sha Tin Sewage Treatment Works to Caverns –
Site Preparation and Access Tunnel Construction

Appendix B

Calibration Certificates of Monitoring Equipment



Calibration Certificate

Certificate No. **200340**

Page 1 of 2 Pages

Customer : Lam Environmental Services Ltd

Address : 19/F, Remex Centre, 42 Wong Chuk Hang Road, Hong Kong

Order No. : Q14456

Date of receipt : 12-Jan-22

Item Tested

Description : Aerosol Mass Monitor

Manufacturer : Met One

I.D. : --

Model : Aerocet 831

Serial No. : Y23154

Test Conditions

Date of Test : 24-Jan-22

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Calibration procedure : Manufacturer recommended method (gravimetric), Z28.

Test Results

All results were within the tolerance(s).

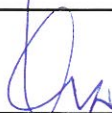
The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S136B	Stop Watch	102964	SCL-HKSAR
S238	Micro Balance	108228	NIM-PRC
S201	Std. Test Dust	61291	NIST
S207B	Std. Flowmeter	LL-2104002489	NIM-PRC

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

Calibrated by : 
Kin Wong

Approved by : 
Steve Kwan

This Certificate is issued by:

Hong Kong Calibration Ltd

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

Date: 24-Jan-22



Calibration Certificate

Certificate No. 200340

Page 2 of 2 Pages

Results :

1. General

Internal Filters : checked and found clean.

2. Flow Meter

UUT Nominal Value (LPM)	Measured Value (LPM)	Tolerance (LPM)	Uncertainty
2.83	2.85	± 0.15	± 0.05

3. Timer

Reference Value	UUT Reading	Tolerance	Uncertainty
10' 00" 12	10 min	± 2 sec/hr	± 0.5 sec/hr

4. Dust Particle (PM₁₀)

Applied Value ($\mu\text{g}/\text{m}^3$)	UUT Reading ($\mu\text{g}/\text{m}^3$) K Factor : 0.28	Tolerance	Uncertainty
1090	1092	± 20 %	± 10 %

Remark : 1. UUT: Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. ISO 12103-1 A1 respirable standard test dust was used for the calibration.

4. The K Factor to be adjusted by the customer from 1.0 to 0.28.

----- END -----



Portable Dust Meter Performance Check Record

Portable Dust Meter

Type : Particulate Monitor
 Manufacturer : MET ONE INSTRUMENTS
 Model Number : AEROCET831
 Serial Number : Y23154
 Performance Check Date : 11-Feb-22

Standard Equipment

Type : High Volume Sampler
 Manufacturer : TISCH
 Model Number : TE-5170
 Equipment Number : HVS018 (S/N:2656)
 Last Calibration Date : 30-Dec-21

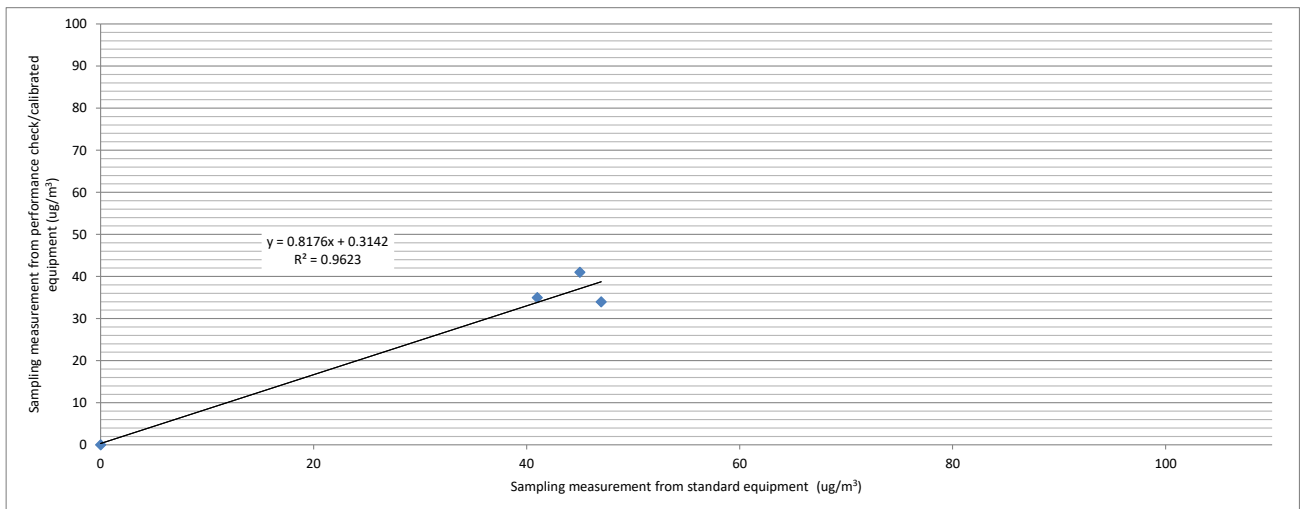
Portable Dust Meter Performance Check Results

Trial no. in 1-hr period	Time	Mean Pressure (hPa)	Mean Temp (°C)	Concentration in ug/m ³ (Standard equipment) (X - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (Y - Axis)
Zero Check	11/2/22 08:30	1017	19	0	0
1	11/2/22 09:30	1017	19	45	41
2	11/2/22 10:30	1017	19	41	35
3	11/2/22 13:00	1017	19	47	34

* Filter paper weighting was conducted by HOKLAS accredited laboratory.

Linear Regression of Y on X

Slope (K- factor) : 1.2000
 Correlation Coefficient : 0.9810
 Validity of Performance Check / Calibration Record : 11/2/2023



Operator: Alan Ng

Date: 19-Feb-22

Checked by: Derek Lo

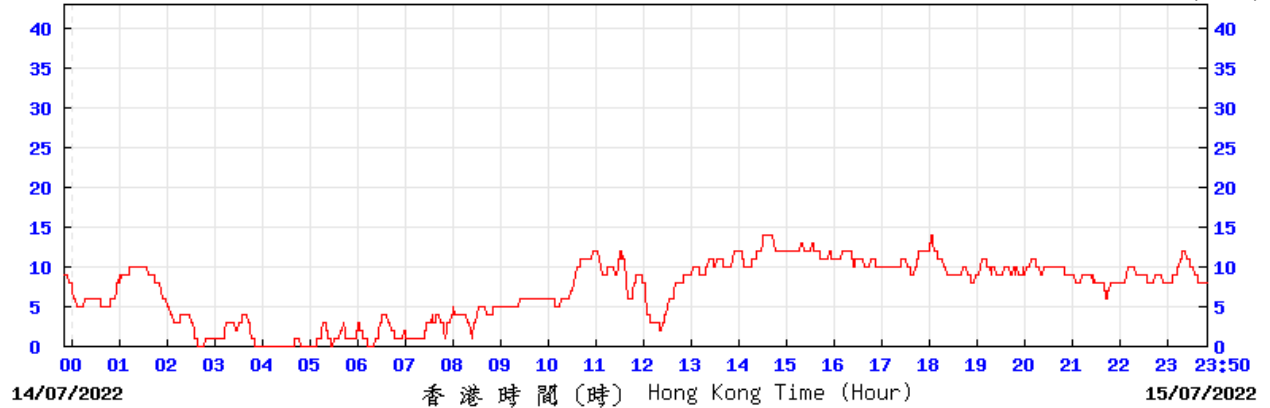
Date: 19-Feb-22



Appendix C

Wind Data Extracted from the Tsing Yi HKO Automatic Weather Station

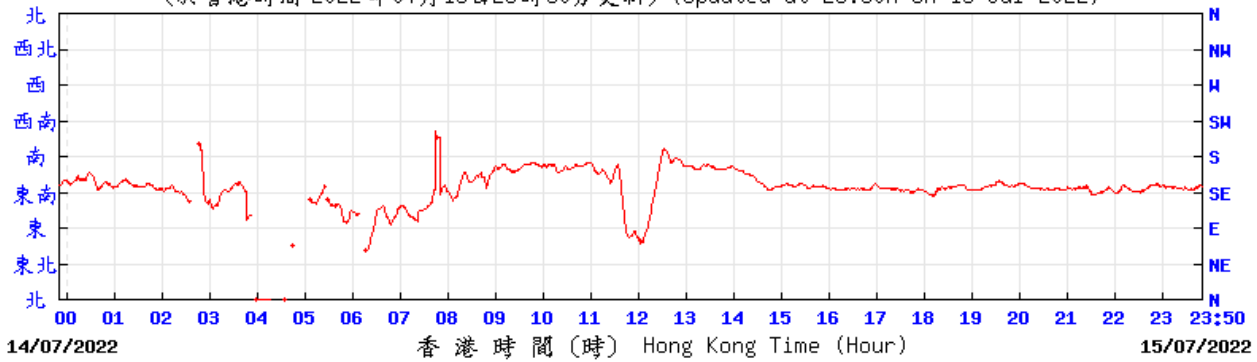
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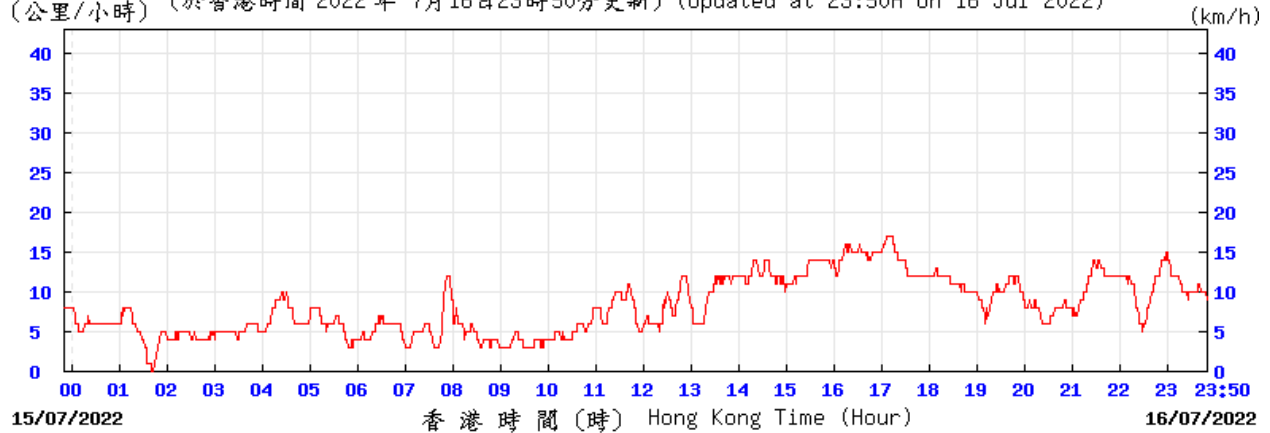
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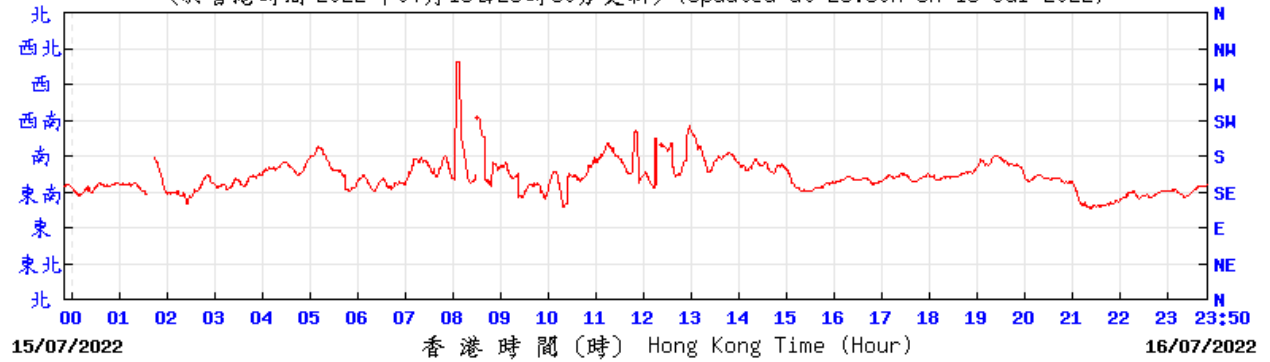
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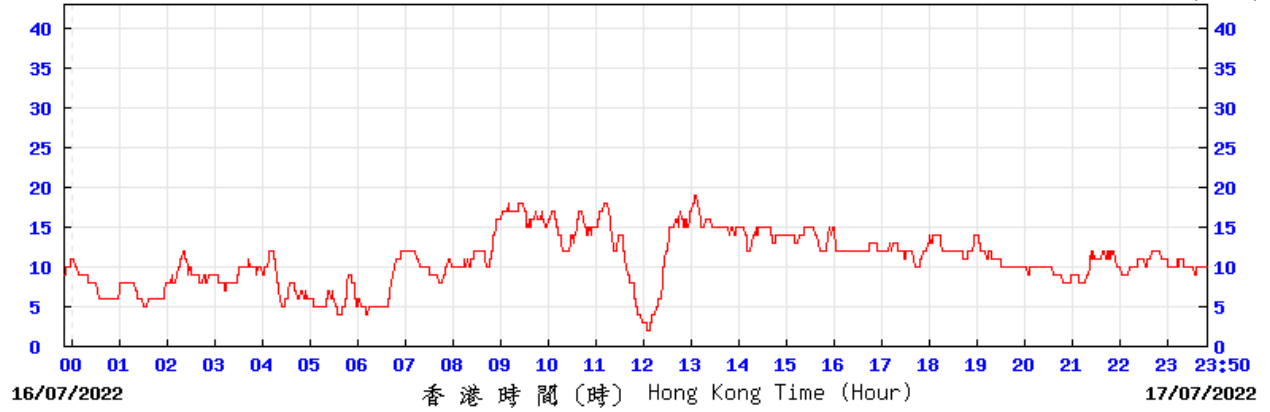
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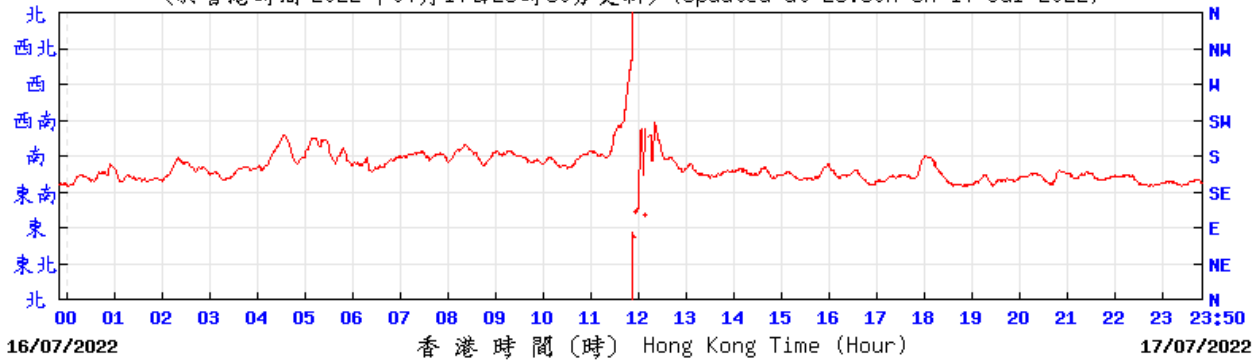
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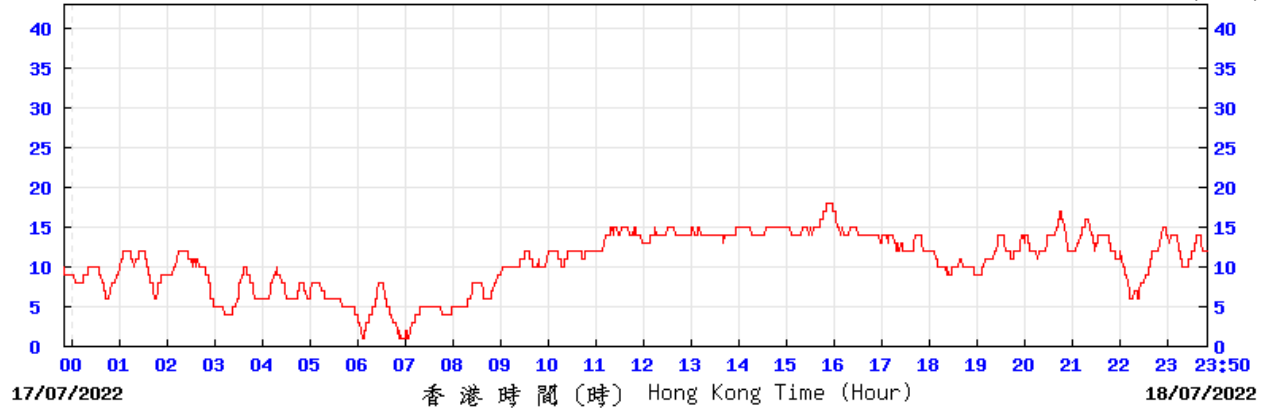
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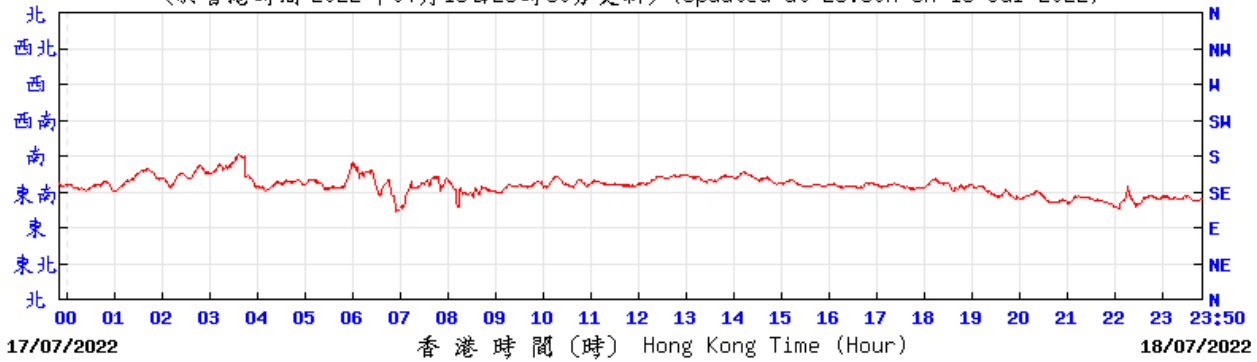
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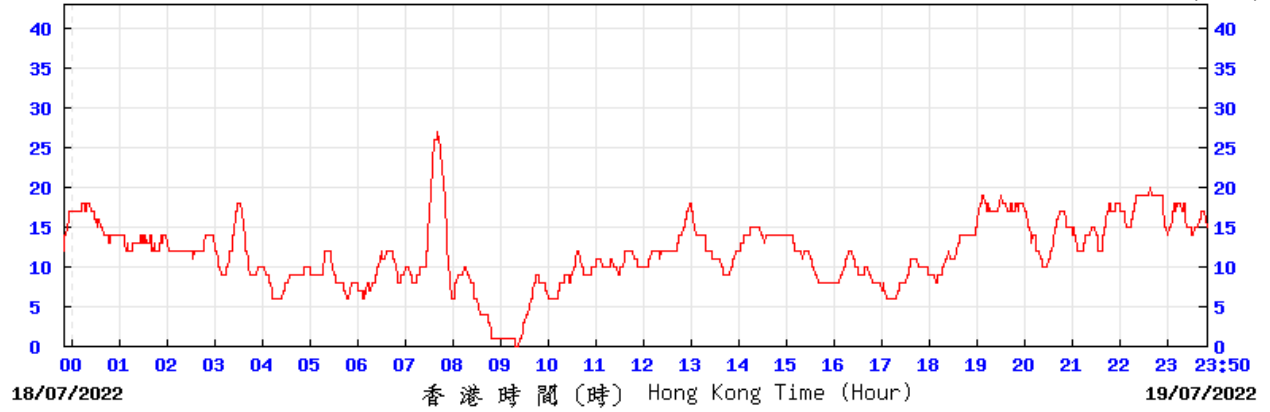
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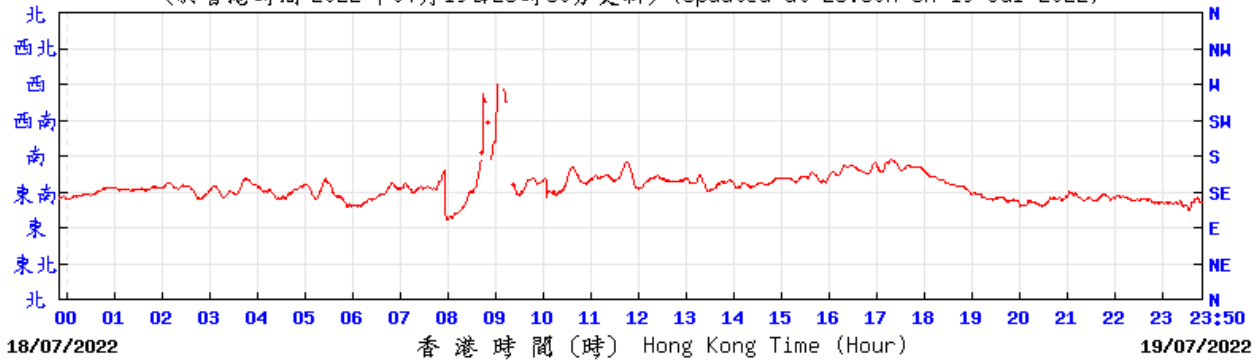
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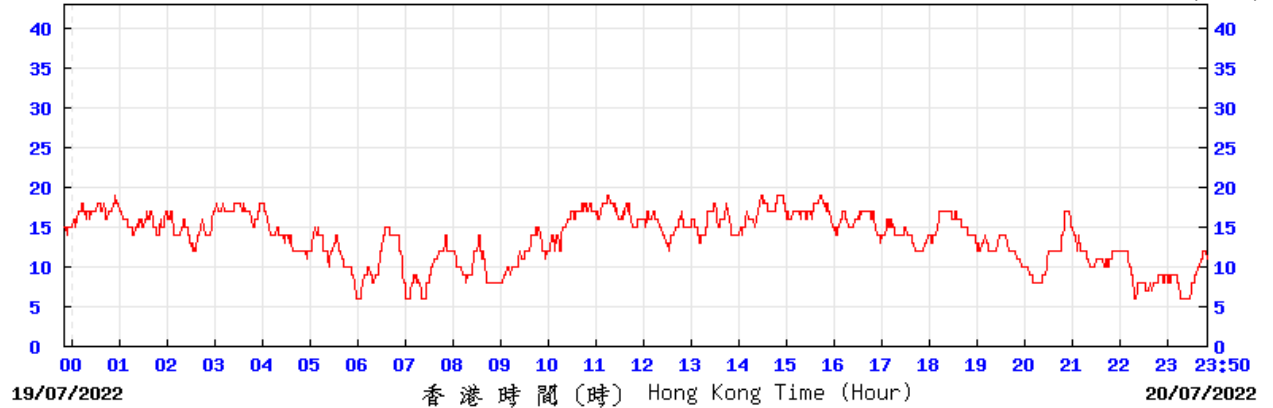
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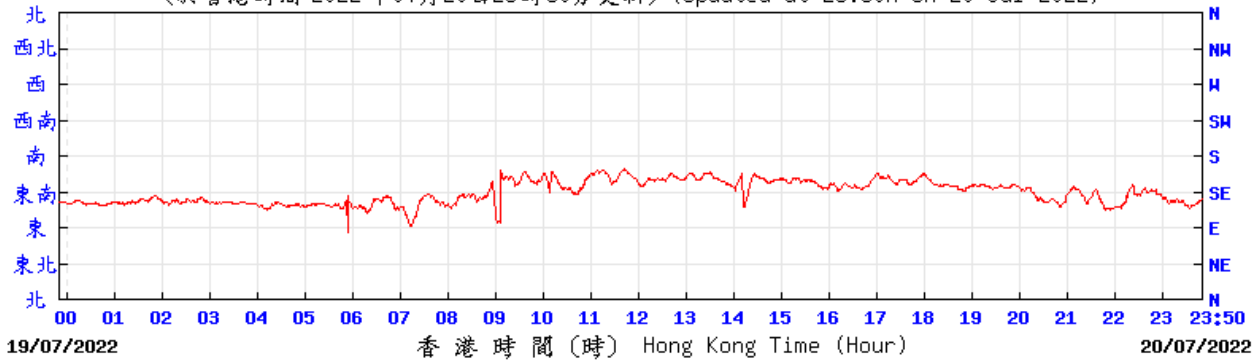
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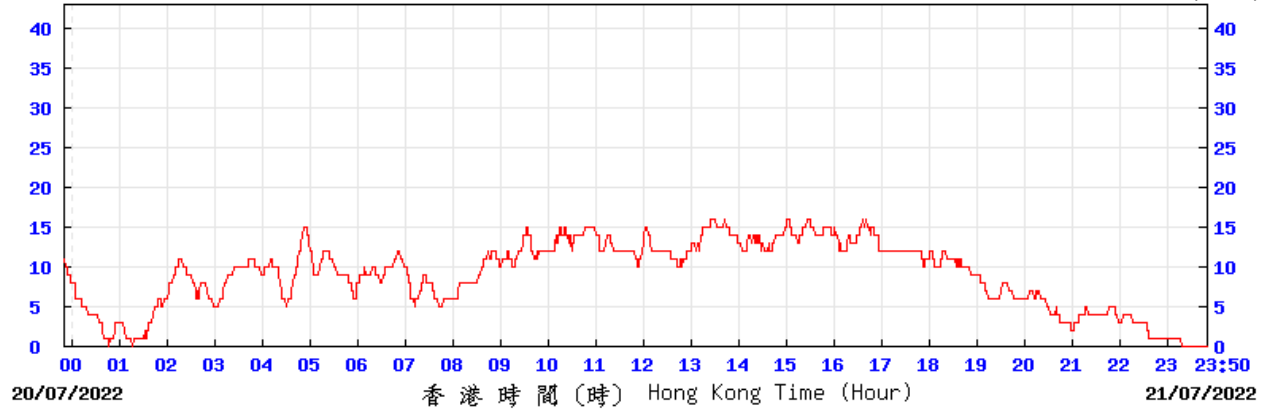
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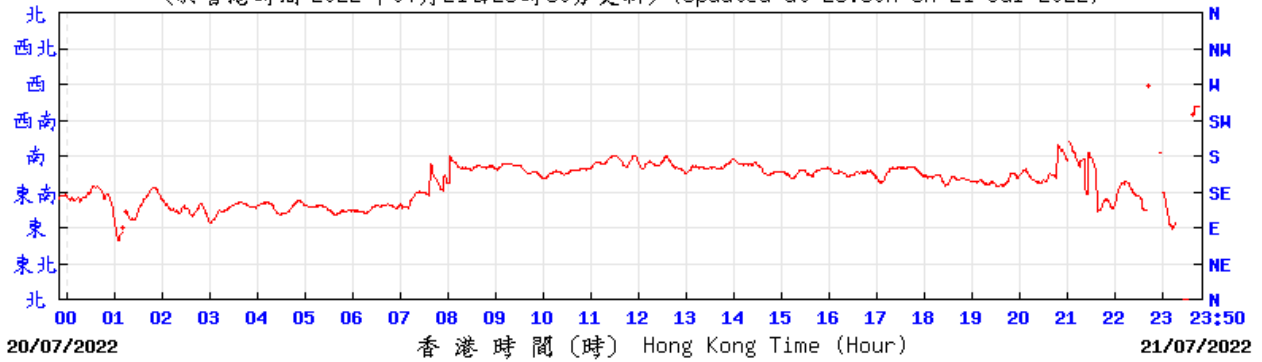
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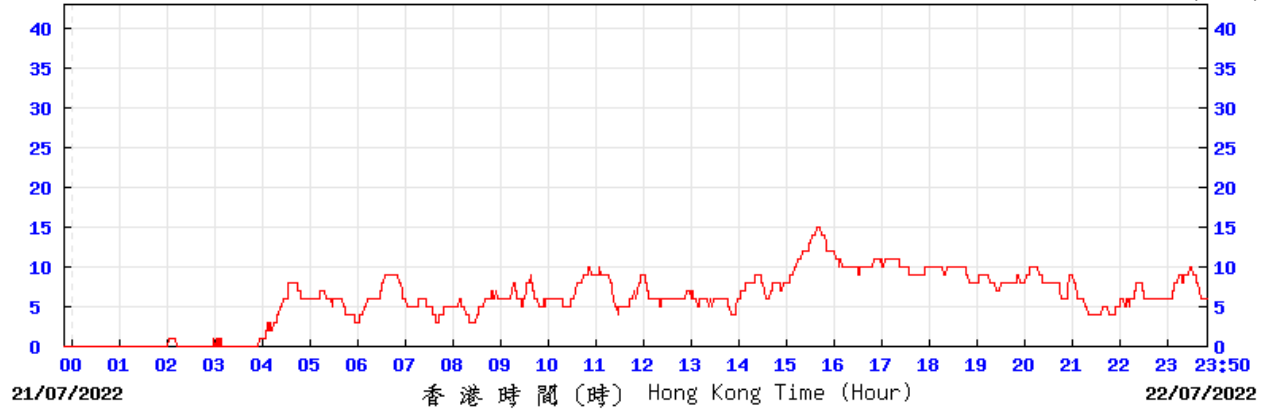
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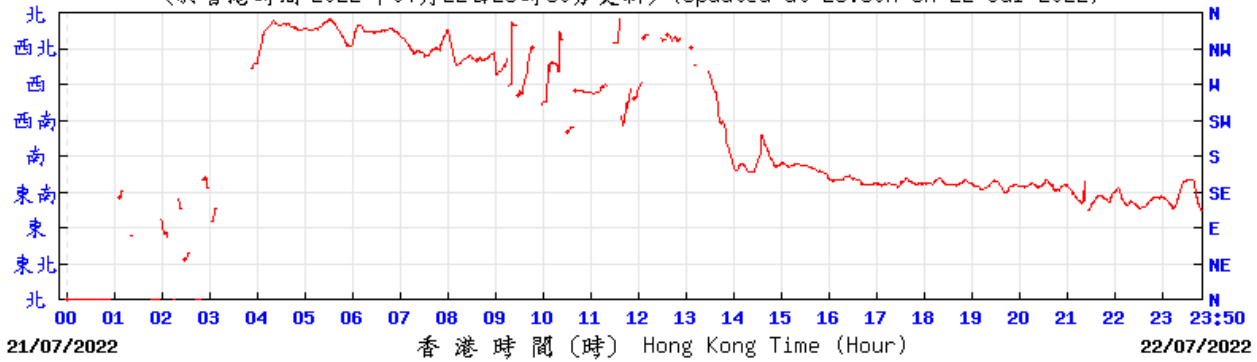
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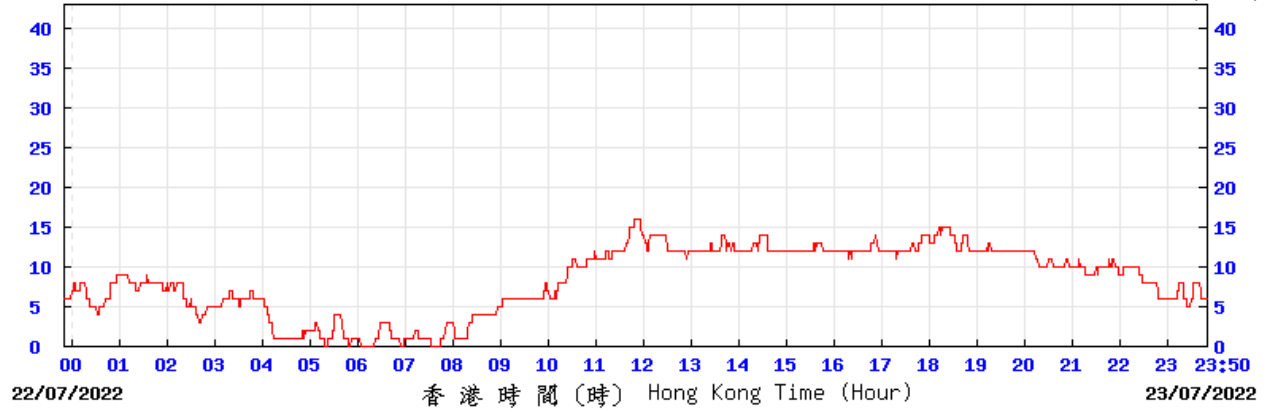
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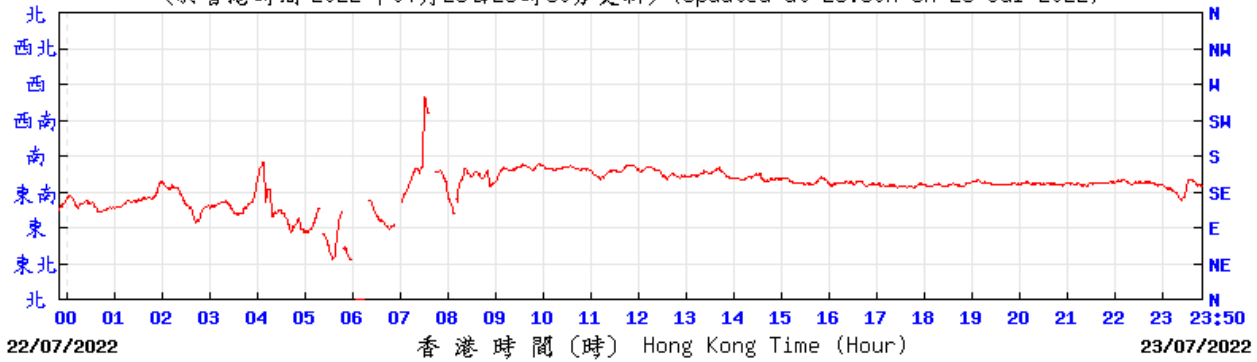
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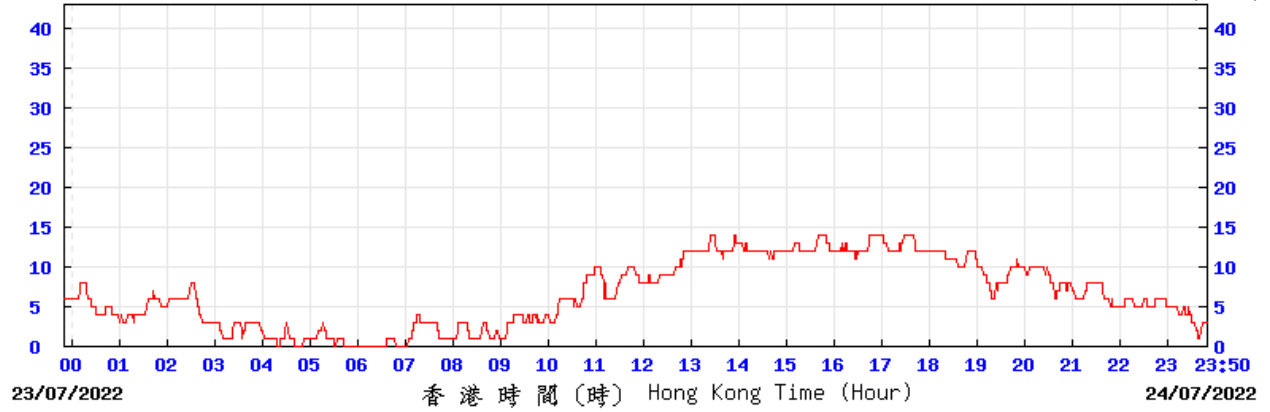
(於香港時間 2022 年 07 月 23 日 23 時 50 分更新) (Updated at 23:50H on 23 Jul 2022)



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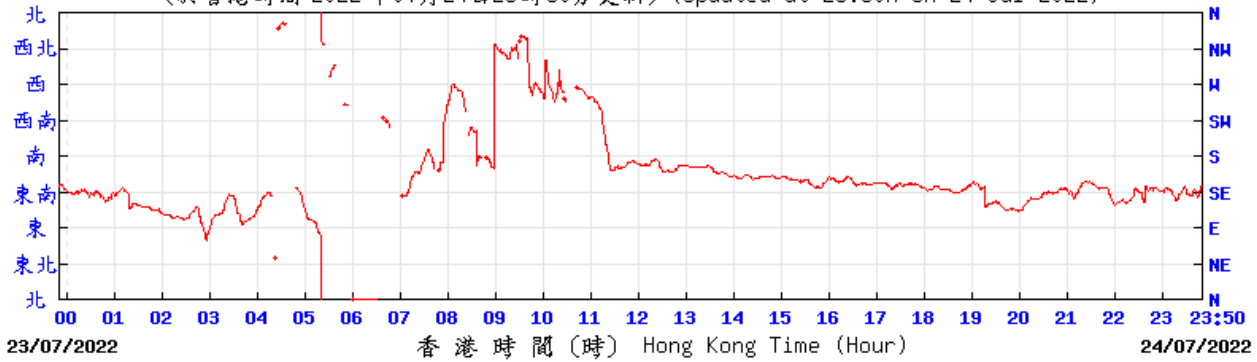
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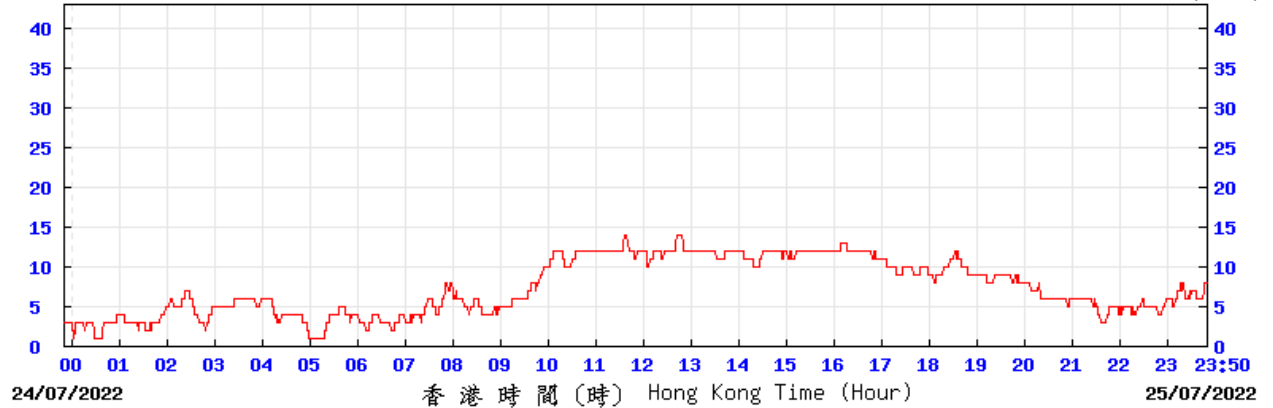
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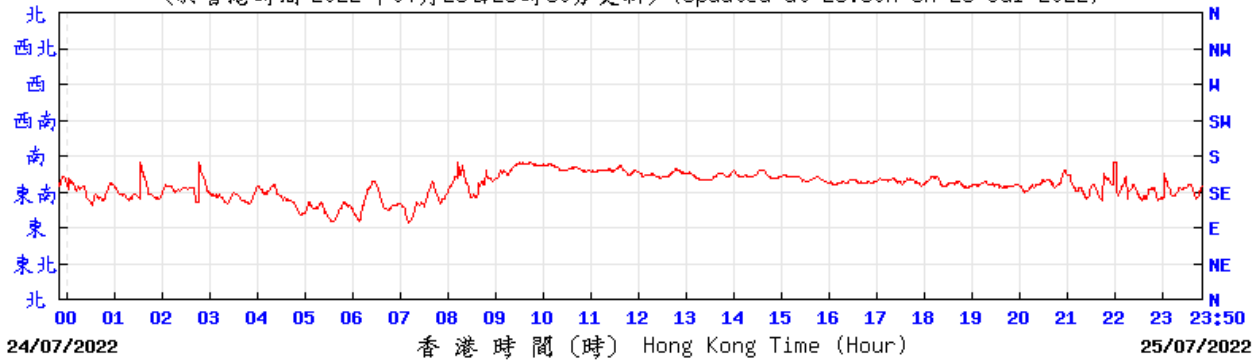
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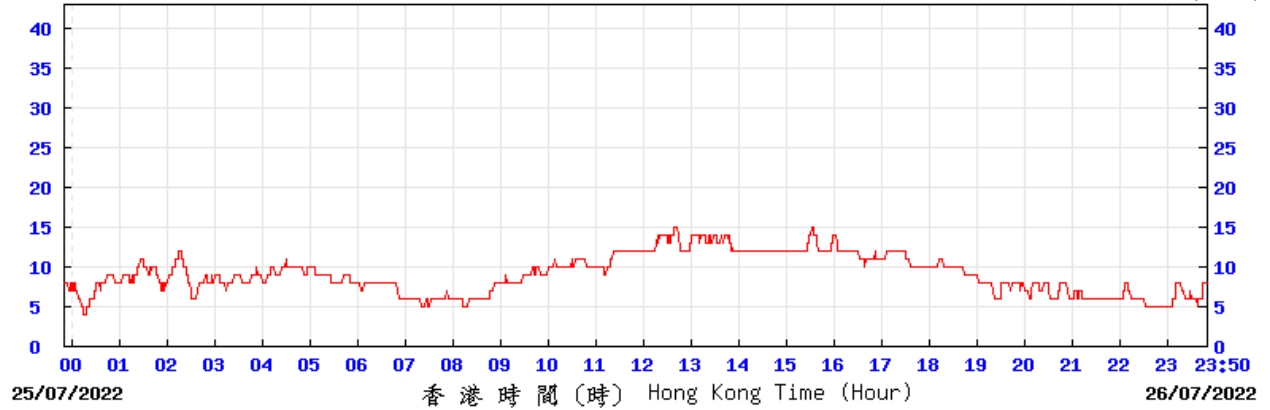
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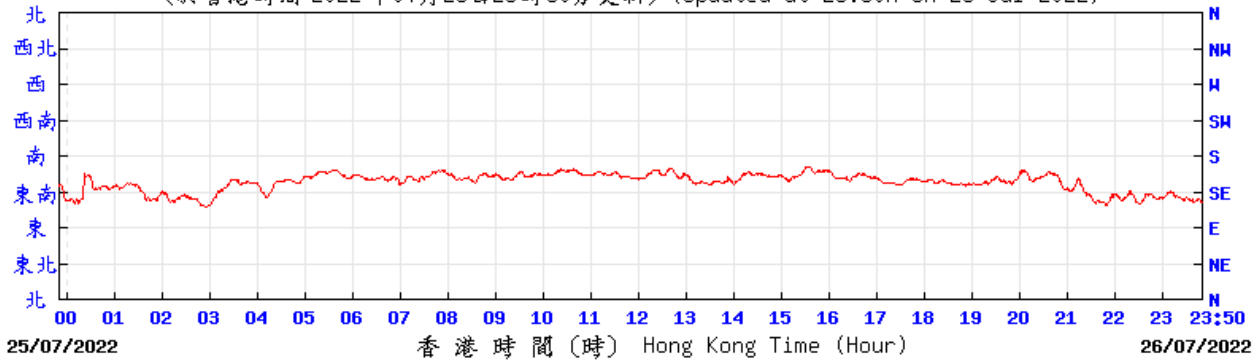
(公里/小時) (於香港時間 2022 年 7 月 26 日 23 時 50 分更新) (Updated at 23:50H on 26 Jul 2022) (km/h)



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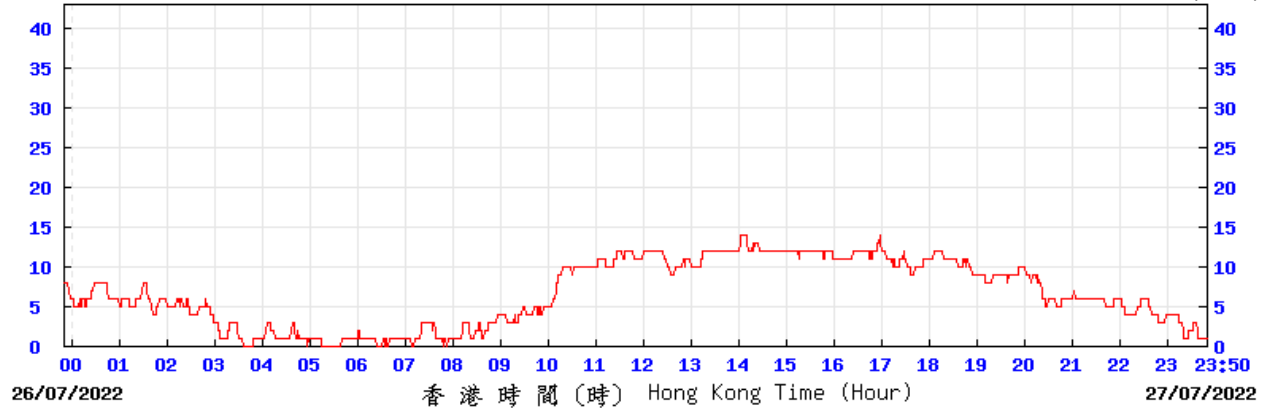
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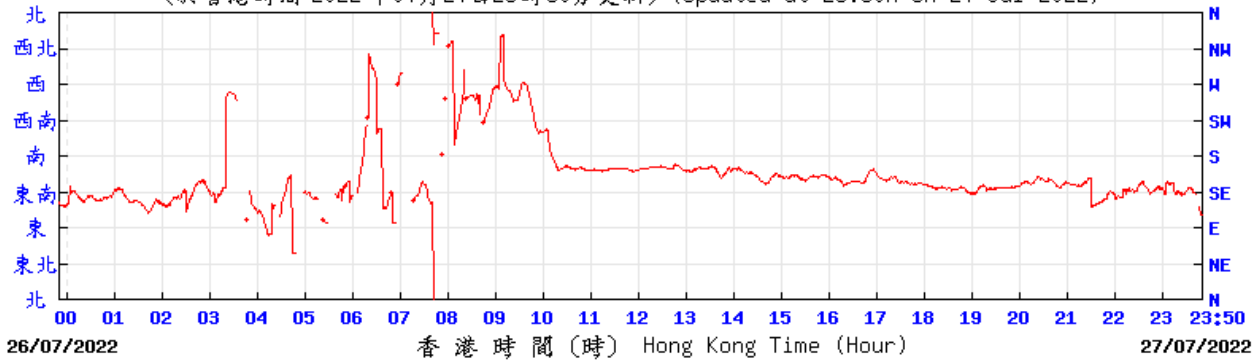
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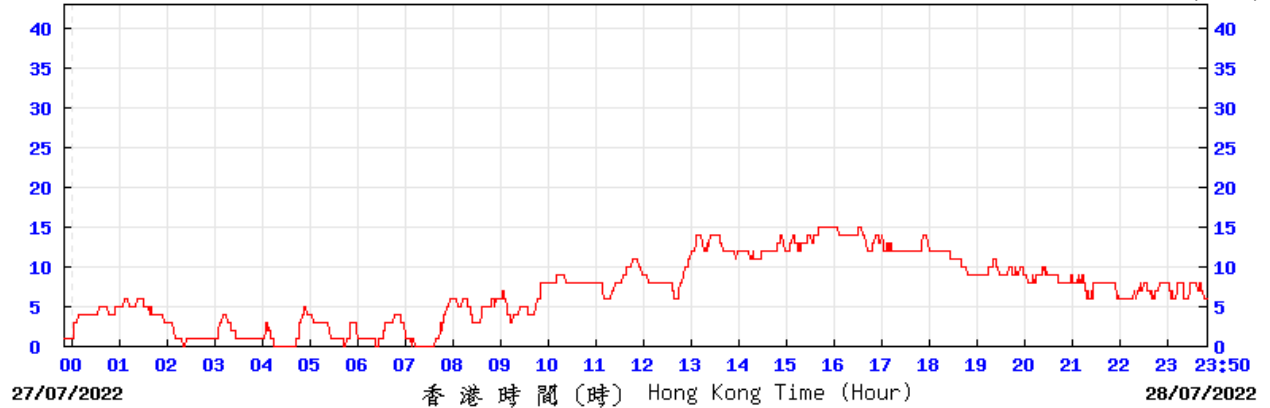
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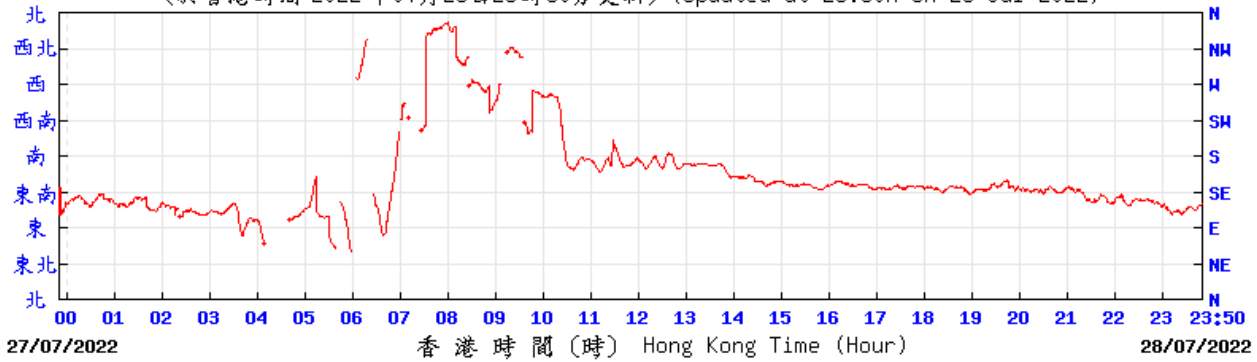
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Lam Environmental Services Limited

Contract No. STW 01/2021
Environmental Team for Relocation of
Sha Tin Sewage Treatment Works to Caverns –
Site Preparation and Access Tunnel Construction

Appendix D

Baseline Air Quality Monitoring Data

1hr TSP Monitoring Results at ASR51 - The Hong Kong Yaumati Ferry Company Ltd. Administrative Building

Date	Weather Condition	Time	Mass Concentration (µg/m ³)
15-Jul-22	Cloudy	8:58	117
15-Jul-22	Cloudy	9:59	87
15-Jul-22	Cloudy	11:00	118
16-Jul-22	Cloudy	8:04	151
16-Jul-22	Cloudy	9:05	140
16-Jul-22	Cloudy	10:06	93
17-Jul-22	Sunny	8:41	60
17-Jul-22	Sunny	9:42	74
17-Jul-22	Sunny	10:43	87
18-Jul-22	Sunny	8:43	42
18-Jul-22	Sunny	9:44	39
18-Jul-22	Sunny	10:45	32
19-Jul-22	Sunny	13:18	26
19-Jul-22	Sunny	14:19	24
19-Jul-22	Sunny	15:20	34
20-Jul-22	Sunny	8:18	28
20-Jul-22	Sunny	9:19	32
20-Jul-22	Sunny	10:20	32
21-Jul-22	Sunny	9:09	233
21-Jul-22	Sunny	10:10	184
21-Jul-22	Sunny	11:11	220
22-Jul-22	Sunny	8:45	114
22-Jul-22	Sunny	9:46	92
22-Jul-22	Sunny	10:47	66
23-Jul-22	Sunny	8:37	80
23-Jul-22	Sunny	9:38	81
23-Jul-22	Sunny	10:39	65
24-Jul-22	Sunny	8:04	22
24-Jul-22	Sunny	9:05	26
24-Jul-22	Sunny	10:06	31
25-Jul-22	Sunny	13:43	78
25-Jul-22	Sunny	14:44	47
25-Jul-22	Sunny	15:45	40
26-Jul-22	Sunny	13:12	59
26-Jul-22	Sunny	14:13	72
26-Jul-22	Sunny	15:14	40
27-Jul-22	Sunny	8:43	159
27-Jul-22	Sunny	9:44	141
27-Jul-22	Sunny	10:45	127
28-Jul-22	Sunny	9:08	235
28-Jul-22	Sunny	10:09	218
28-Jul-22	Sunny	11:10	199

Average	91.57
Max	235.12
Min	22.12
Action Level	310
Limit Level	500



Lam Environmental Services Limited

Contract No. STW 01/2021
Environmental Team for Relocation of
Sha Tin Sewage Treatment Works to Caverns –
Site Preparation and Access Tunnel Construction

Appendix E

Updated Construction Programme

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart (2021-2027)											
DC/2020/05, Relocation of STST to Caverns - Main Caverns Construction																				
Contract Particulars, Key Dates, Section of Completions, Access Dates																				
Contract Date, Starting Date																				
C-C1020	Completion Date for the whole of the works (2042d)	0%	0		06-Feb-27*		06-Feb-27	0	Gantt Chart: Completion Date for the whole of the works (2042d) - Milestone on 06-Feb-27											
C1000	Contract Date	100%	0	23-Jun-21 A					Gantt Chart: Contract Date - Milestone on 23-Jun-21											
C1010	Starting Date	100%	0	05-Jul-21 A					Gantt Chart: Starting Date - Milestone on 05-Jul-21											
Contract Key Date																				
C-KD1	KD1 (365d): Complete Temp Explosive Magazine (Mode A store) and approval of Mode A Store Licence by CoM	100%	0		18-Jul-22 A				Gantt Chart: KD1 - Milestone on 18-Jul-22											
C-KD2	KD2 (800d): Complete Top-Heading Excavation Works of Branch Driveway 3 (BD3)	0%	0		13-Sep-23*		13-Sep-23	0	Gantt Chart: KD2 - Milestone on 13-Sep-23											
Contract Sectional Completion																				
C-Sect01	Sect 1 (1093d): Comprises site formation works and slope works in Portion 10	0%	0		12-Jul-24*		12-Jul-24	0	Gantt Chart: Sect 1 - Milestone on 12-Jul-24											
C-Sect02	Sect 2 (2012d): Comprise all Works not covered in any other section	0%	0		07-Jan-27*		07-Jan-27	0	Gantt Chart: Sect 2 - Milestone on 07-Jan-27											
C-Sect03	Sect 3 (1643d): complete 3 (i), (ii), (iii), (iv), (v)	0%	0		03-Jan-26*		03-Jan-26	0	Gantt Chart: Sect 3 - Milestone on 03-Jan-26											
C-Sect04	Sect 4 (1460d): complete 4 (i), (ii), (iii), (iv)	0%	0		04-Jul-25*		04-Jul-25	0	Gantt Chart: Sect 4 - Milestone on 04-Jul-25											
C-Sect05	Sect 5 (1278d): Comprises all works in Portion 7 and handed over to Portion 2A and 7	0%	0		03-Jan-25*		03-Jan-25	0	Gantt Chart: Sect 5 - Milestone on 03-Jan-25											
C-Sect06	Sect 6 (2012d): Comprises the Preservation and Protection of Existing Trees	0%	0		07-Jan-27*		07-Jan-27	0	Gantt Chart: Sect 6 - Milestone on 07-Jan-27											
C-Sect07	Sect 7 (2042d): Complete fully coordinated as-built BIM model	0%	0		06-Feb-27*		06-Feb-27	0	Gantt Chart: Sect 7 - Milestone on 06-Feb-27											
C-Sect08	Sect 8 (2012d): Comprises the Establishment Works to Landscape softworks	0%	0		07-Jan-27*		07-Jan-27	0	Gantt Chart: Sect 8 - Milestone on 07-Jan-27											
Access Dates																				
Access01	Access dates of Portion 1 (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access01 - Milestone on 29-Mar-22											
Access02	Access dates of Portion 2 (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access02 - Milestone on 29-Mar-22											
Access02-1	Access dates of Part of Portion 2 (20 Jan 22)	100%	0	20-Jan-22 A					Gantt Chart: Access02-1 - Milestone on 20-Jan-22											
Access02A	Access dates of Portion 2A (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access02A - Milestone on 29-Mar-22											
Access02B	Access dates of Portion 2B (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access02B - Milestone on 29-Mar-22											
Access03	Access dates of Portion 3 (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access03 - Milestone on 29-Mar-22											
Access04	Access dates of Portion 4, 4A (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access04 - Milestone on 29-Mar-22											
Access05A	Access dates of Portion 5A (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access05A - Milestone on 29-Mar-22											
Access05B	Access dates of Portion 5B (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access05B - Milestone on 29-Mar-22											
Access05C	Access dates of Portion 5C (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access05C - Milestone on 29-Mar-22											
Access06	Access dates of Portion 6 (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access06 - Milestone on 29-Mar-22											
Access06A	Access dates of Portion 6A (300d)	100%	0	29-Mar-22 A					Gantt Chart: Access06A - Milestone on 29-Mar-22											
Access06A-1	Access dates of Part of Portion 6A (20 Jan 2022)	100%	0	20-Jan-22 A					Gantt Chart: Access06A-1 - Milestone on 20-Jan-22											

- Remaining Level of Effort
- Actual Level of Effort
- Project Baseline
- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone

Project File: C2-MP004(2210)
 Layout: MPR - UWP (submission)
 Data Date: 08-Oct-22
 Page 1 of 55
 Baseline: C2-MP004(2209)

Contract No. DC/2020/05
Relocation of STST to Caverns - Main Caverns Construction
Monthly Progress Update



Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart Timeline												
									2021	2022	2023	2024	2025	2026	2027						
										Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Access07	Access dates of Portion 7 (300d)	100%	0	29-Mar-22	A																
Access08	Access dates of Portion 8 (300d)	100%	0	29-Mar-22	A																
Access09	Access dates of Portion 9 (300d)	100%	0	20-Jan-22	A																
Access10	Access dates of Portion 10 (Starting Date)	100%	0	05-Jul-21	A																
Access11	Access dates of Portion 11 (Starting Date)	100%	0	05-Jul-21	A																
Access12	Access dates of Portion 12 (Starting Date)	100%	0	05-Jul-21	A																
Access13	Access dates of Portion 13 (Starting Date)	100%	0	05-Jul-21	A																
Access13A	Access dates of Portion 13A (Starting Date)	100%	0	05-Jul-21	A																
AccessWA1	Access dates of Works Area WA1 (300d)	100%	0	25-Aug-21	A																
AccessWA2	Access dates of Works Area WA2 (Starting date)	100%	0	05-Jul-21	A																
AccessWA3	Access dates of Works Area WA3 (60d)	100%	0	06-Aug-21	A																
AccessWA4	Access dates of Works Area WA4 (60d)	100%	0	13-Aug-21	A																
Planned Completion Dates																					
Planned Key Date Completion																					
KD01	Planned KD1 - Complete Temp Explosive Magazine (Mode A store) and approval of Mode A Store Licence by CoM	0%	0		21-Oct-22*		18-Jul-22	-95													
KD02	Planned KD2 - Complete Top-Heading Excavation Works of Branch Driveway 3 (BD3)	0%	0		11-Mar-23		13-Sep-23	186													
Planned Sectional Completion																					
Sect01	Planned Sect 1 - Comprises site formation works and slope works in Portion 10	0%	0		22-Jul-24		12-Jul-24	-10													
Sect02	Planned Sect 2 - Comprise all Works not covered in any other section	0%	0		02-Oct-26		07-Jan-27	97													
Sect03	Planned Sect 3 - complete 3 (i), (ii), (iii), (iv), (v)	0%	0		11-Sep-25		03-Jan-26	114													
Sect03a	Planned Sect 3 (i) - Tunnel/ Caverns/ventilation adit and Shaft excavation works in Portion 9, 10, 11, 13 and 13A	0%	0		17-Aug-24		03-Jan-26	504													
Sect03b	Planned Sect 3 (ii) - Permanent lining, OHVD with protected corridor, emergency bypass, pipework, road in P6A,9,10,13	0%	0		11-Sep-25		03-Jan-26	114													
Sect03c	Planned Sect 3 (iii) - Effluent pipelines construction and THEES connection works in Portion 6A,9,13	0%	0		14-May-25		03-Jan-26	234													
Sect03d	Planned Sect 3 (iv) - Handover of Portion 1, 2B, 5A, 5B, 5C, 6A, 8, 9, 13, WA2 to the Client	0%	0		11-Sep-25		03-Jan-26	114													
Sect03e	Planned Sect 3 (v) - Handover of diverted steel bridge across A Kung Kok Street in Portion 4, 5B, 6A to the Client	0%	0		27-Nov-24		03-Jan-26	402													
Sect04	Planned Sect 4 - complete 4 (i), (ii), (iii), (iv)	0%	0		27-Nov-24		04-Jul-25	219													
Sect04a	Planned Sect 4 (i) - Comprises diversion of a steel bridge across A Kung Kok Street connecting Portion 4, 6, 6A	0%	0		27-Nov-24		04-Jul-25	219													
Sect04b	Planned Sect 4 (ii) - Retaining Wall RMP7 and site formation works in Portion 6A	0%	0		10-Oct-24		04-Jul-25	267													
Sect04c	Planned Sect 4 (iii) - All other works in Portion 6	0%	0		27-Nov-24		04-Jul-25	219													
Sect04d	Planned Sect 4 (iv) - Handover of Portion 6 to the Client	0%	0		27-Nov-24		04-Jul-25	219													
Sect05	Planned Sect 5 - Comprises all works in Portion 7 and handed over to Portion 2A and 7	0%	0		10-Oct-24		03-Jan-25	85													
Sect06	Planned Sect 6 - Comprises the Preservation and Protection of Existing Trees	0%	0		07-Jan-27		07-Jan-27	0													
Sect07	Planned Sect 7 - Complete fully coordinated as-built BIM model	0%	0		24-Oct-26		06-Feb-27	105													
Sect08	Planned Sect 8 - Comprises the Establishment Works to Landscape softworks	0%	0		11-Sep-26		07-Jan-27	118													
Planned Completion of the Whole of the Works																					
C1020	Planned Completion Date for the Whole of the Works	0%	0		24-Oct-26		06-Feb-27	105													
Preliminary Works & Preparation Works																					

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart												
									2021	2022	2023	2024	2025	2026	2027						
A10000	Hoarding Design Preparation	100%	0	19-Aug-21 A	23-Sep-21 A																
A10010	Hoarding Design approval	100%	0	24-Sep-21 A	18-Oct-21 A																
A19990	Hoarding Plan Preparation	100%	0	19-Aug-21 A	23-Sep-21 A																
A20000	Hoarding Plan approval	100%	0	24-Sep-21 A	28-Oct-21 A																
A20010	Hoarding erection ready to start	100%	0	28-Oct-21 A																	
Hoarding Erection																					
A10020	Hoarding erection - Portion 6A (Main Portal Area)	100%	0	08-Apr-22 A	30-Apr-22 A																
A10030	Hoarding erection - Portion 10 (Secondary Portal Area)	100%	0	08-Nov-21 A	08-Dec-21 A																
A10060	Hoarding erection - WA3	100%	0	08-Oct-21 A	12-Dec-21 A																
Site Office at WA2																					
MS Submission for Demolition Works																					
A10440	Asbestos removal - method statement preparation	100%	0	09-Aug-21 A	18-Aug-21 A																
A10450	Asbestos removal - method statement approval by PM and EPD	100%	0	19-Aug-21 A	29-Sep-21 A																
Hoarding at WA2																					
A10040	Hoarding at WA2 - erect hoarding	100%	0	27-Sep-21 A	22-Oct-21 A																
Demolition of Existing Building at WA2																					
A10460	Demolition Ex. DSD Building - remove Asbestos	100%	0	07-Oct-21 A	22-Oct-21 A																
A10468	Demolition Ex. DSD Building - Disconnect utility services	100%	0	08-Oct-21 A	15-Oct-21 A																
A10470	Demolition Ex. DSD Building - carry out demolition work	100%	0	25-Oct-21 A	08-Dec-21 A																
Site Office Erection at WA2																					
A10480	WA2 Site office - design preparation and submission	100%	0	17-Aug-21 A	22-Jun-22 A																
A10490	WA2 Site office - design approval	100%	0	10-Jan-22 A	08-Jul-22 A																
A10495	WA2 Handed over to Dept of Health (30-3 to 30-9)	100%	0	30-Mar-22 A	30-Sep-22 A																
A10500	WA2 Site office - off-site fabrication	82.03%	46	17-Jan-22 A	30-Nov-22	05-Oct-22	26-Nov-22	-3													
A10510	WA2 Site office - unit delivery to site	0%	6	01-Dec-22	07-Dec-22	28-Nov-22	03-Dec-22	-3													
A10520	WA2 Site office - Erection & installation	0%	50	08-Dec-22	14-Feb-23	05-Dec-22	10-Feb-23	-3													
A10530	WA2 Site Office - T&C	0%	14	15-Feb-23	02-Mar-23	11-Feb-23	27-Feb-23	-3													
A10540	WA2 Site Office - Site office complete	0%	0		02-Mar-23*		27-Feb-23	-3													
WA3 Rock Crushing Plant Design, Procurement and Installation																					
WA3 Rock Crushing Plant - Design																					
A21000	WA3 - Rock Crushing Plant - Design preparation and submission (included in ERR submission)	100%	0	20-Sep-21 A	05-Nov-21 A																
A21010	WA3 - Rock Crushing Plant - PM, ET review and acceptance	100%	0	22-Oct-21 A	14-Apr-22 A																
WA3 Rock Crushing Plant - Application of Specific Process License																					
A21020	WA3 - Rock Crushing Plant - carry out AQIA & prepare APCP	100%	0	10-Dec-21 A	24-Jan-22 A																
A21022	WA3 - Rock Crushing Plant - Submit Form 1 to EPD	100%	0	04-Apr-22 A	04-Apr-22 A																
A21030	WA3 - Rock Crushing Plant - EPD grant Specific Process License	100%	0	14-Apr-22 A	30-Sep-22 A																
A21040	WA3 - Rock Crushing Plant - submit report to EPD	0%	6	17-Nov-22	23-Nov-22	04-Dec-23	09-Dec-23	307													

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart												
									2021	2022	2023	2024	2025	2026	2027						
WA3 Rock Crushing Plant - Application of Variation of Environmental Permit (VEP)																					
A20480	[Summary] VEP & Specified Process under APCO - Prepare and make application to EPD	100%	0	20-Sep-21 A	11-Aug-22 A																
A21110	WA3 - Rock Crushing Plant - VEP - preparation of ERR	100%	0	20-Sep-21 A	05-Nov-21 A																
A21120	WA3 - Rock Crushing Plant - VEP - liaison with EPD & update information of AQIA to ERR	100%	0	18-Dec-21 A	11-May-22 A																
A21130	WA3 - Rock Crushing Plant - VEP - submit Form 5 to EPD	100%	0	08-May-22 A	19-Jul-22 A																
A21140	WA3 - Rock Crushing Plant - VEP - EPD grant VEP	100%	0	20-Jul-22 A	11-Aug-22 A																
WA3 Rock Crushing Plant - Procurement																					
A21045	WA3 - Rock Crushing Plant - complete subletting for crusher setup and running	100%	0		14-Dec-21 A																
A21050	WA3 - Rock Crushing Plant - plant procurement & delivery	100%	0	15-Dec-21 A	17-May-22 A																
WA3 Rock Crushing Plant - Installation of Rock Crushing Plant																					
A21055	WA3 handed over to DEVB from 15-3 to 31-7	100%	0	31-Mar-22 A	15-Jul-22 A																
A21060	WA3 - Rock Crushing Plant - installation	89.61%	8	16-Jul-22 A	17-Oct-22	25-Oct-23	02-Nov-23	307													
A21070	WA3 - Rock Crushing Plant - Plant commissioning trial	0%	26	18-Oct-22	16-Nov-22	03-Nov-23	02-Dec-23	307													
A21080	WA3 - Rock Crushing Plant - License and VEP issued, ready for operation	0%	0		23-Nov-22		09-Dec-23	307													
Temporary Explosive Magazine																					
General																					
A17380	Temp Explosive Mag. - Prepare and submit design of Temporary Explosive Magazine	100%	0	20-Jul-21 A	17-Aug-21 A																
A17580	Temp Explosive Mag. - Temporary Explosive Magazine design approval	100%	0	18-Aug-21 A	03-Nov-21 A																
A18380	Temp Explosive Mag. - Prepare method statement of temporary Explosive Magazine for PM & Mines Dept advanced comment	100%	0	20-Jul-21 A	23-Aug-21 A																
A18380-100	Temp Explosive Mag. - addressing PM & Mines comments	100%	0	24-Aug-21 A	04-Nov-21 A																
A18380-122	Temp Explosive Mag. - PM has no comment to Method Statement [5 Nov 2021]	100%	0		05-Nov-21 A																
A18380-124	Temp Explosive Mag. - JV prepare and submit application to FSD	100%	0	24-Sep-21 A	05-Nov-21 A																
A18390	Temp Explosive Mag. - Method statement approval by mines dept & relevant authorities.	100%	0	05-Nov-21 A	22-Apr-22 A																
A18391	Temp Explosive Mag. - received comments from FSD	100%	0		10-Jan-22 A																
A18470	Temp Explosive Mag. - Submit information of Explosive Delivery Vehicle (EVD) and drivers	100%	0	21-Apr-22 A	23-May-22 A																
A18520	Temp Explosive Mag. - EVD and drivers approval by mines dept.	100%	0	24-May-22 A	01-Aug-22 A																
Temporary Explosive Magazine																					
A18170	Temp Explosive Mag. - Excavation and base slab	100%	0	17-Jan-22 A	02-Mar-22 A																
A18190	Temp Explosive Mag. - Construct Temporary Explosive Store No.1	100%	0	07-Feb-22 A	23-Apr-22 A																
A18200	Temp Explosive Mag. - Construct Temporary Explosive Store No.2	100%	0	01-Mar-22 A	23-Apr-22 A																
A18210	Temp Explosive Mag. - Construct Temporary Explosive Store No.3	100%	0	01-Mar-22 A	23-Apr-22 A																
A18290	Temp Explosive Mag. - Construct Berm around stores	100%	0	28-Feb-22 A	11-Jun-22 A																
A18300	Temp Explosive Mag. - Lightning conductor	100%	0	29-Apr-22 A	10-Jun-22 A																
A18330	Temp Explosive Mag. - Security fence	100%	0	16-May-22 A	22-Jun-22 A																
A18360	Temp Explosive Mag. - BS installation and FS installation	100%	0	07-Apr-22 A	28-Jul-22 A																
A18362	Temp Explosive Mag. - Delivery of FS pump	100%	0	15-Jul-22 A	16-Jul-22 A																
A18364	Temp Explosive Mag. - Installation of FS pump & T&C	100%	0	18-Jul-22 A	28-Jul-22 A																

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart											
									2021	2022	2023	2024	2025	2026	2027					
A25340	SMP5 - Excavation (12.5-9.5mpd)	0%	6	03-Jun-24	08-Jun-24	24-Aug-24	30-Aug-24	69	[Gantt bars for A25340]											
A25350	SMP5 - Soil Nail at 11.5mpd - (b1 - 43) - 43 nos.	0%	12	11-Jun-24	24-Jun-24	31-Aug-24	13-Sep-24	69	[Gantt bars for A25350]											
A25360	SMP5 - Soil Nail at 9.5mpd - (a1 - 32) - 32 nos.	0%	8	25-Jun-24	04-Jul-24	14-Sep-24	24-Sep-24	69	[Gantt bars for A25360]											
A25370	Replace of soil by no fine concrete	0%	26	05-Jul-24	03-Aug-24	04-Jun-25	04-Jul-25	267	[Gantt bars for A25370]											
Main Portal Area - Instrumentation and Monitoring																				
A11620	Main Portion West include RMP7 - Settlement marker	86.39%	20	06-May-22 A	31-Oct-22	20-Jan-23	18-Feb-23	86	[Gantt bars for A11620]											
Main Portal Area - Soil Nail at Slope SMP4																				
A11610	Main Portal West - Soil Nail at 26.5mpd (Bb19 - Bb23) - 5nos	0%	10	01-Mar-24	12-Mar-24	03-Sep-24	13-Sep-24	151	[Gantt bars for A11610]											
Main Portal Area - Retaining Wall RMP7																				
A10584	Sub-letting for earthwork for RMP7	100%	0	20-May-22 A	06-Oct-22 A				[Gantt bars for A10584]											
A10585	Fill access road for RMP7 and SMP5	0%	63	08-Oct-22	20-Dec-22	12-Jan-23	01-Apr-23	79	[Gantt bars for A10585]											
A10588	Temp piling platform for PL1-9	53.49%	20	08-Sep-22 A	31-Oct-22	20-Jan-23	18-Feb-23	86	[Gantt bars for A10588]											
A10590	RMP7 - Prebored H pile (PL1-9)	0%	36	21-Nov-22	04-Jan-23	20-Feb-23	01-Apr-23	69	[Gantt bars for A10590]											
A10600	RMP7 - Prebored H pile (PL10-19)	0%	34	05-Jan-23	20-Feb-23	03-Apr-23	17-May-23	69	[Gantt bars for A10600]											
A10610	RMP7 - Prebored H pile (PL20-47)	0%	112	21-Feb-23	10-Jul-23	18-May-23	28-Sep-23	69	[Gantt bars for A10610]											
A10620	RMP7 - Prebored H pile (PL48-73)	0%	78	21-Dec-22	31-Mar-23	29-Jun-23	28-Sep-23	147	[Gantt bars for A10620]											
A10630	RMP7 - Excavation at (PL1-9)	0%	24	11-Jul-23	07-Aug-23	26-Mar-24	26-Apr-24	210	[Gantt bars for A10630]											
A10650	RMP7 - Excavation & tie-back nail at (PL10-73)	0%	90	11-Jul-23	26-Oct-23	29-Sep-23	18-Jan-24	69	[Gantt bars for A10650]											
A25190	RMP7 - Skin wall and capping beam (PL1-9)	0%	18	08-Aug-23	28-Aug-23	27-Apr-24	20-May-24	210	[Gantt bars for A25190]											
A25200	RMP7 - Skin wall and capping beam (PL10-19)	0%	18	27-Oct-23	16-Nov-23	19-Jan-24	08-Feb-24	69	[Gantt bars for A25200]											
A25210	RMP7 - Skin wall and capping beam (PL20-73)	0%	60	17-Nov-23	29-Jan-24	09-Feb-24	30-Apr-24	69	[Gantt bars for A25210]											
A25220	RMP7 - Mass concrete at PL73	0%	15	30-Jan-24	22-Feb-24	02-May-24	20-May-24	69	[Gantt bars for A25220]											
A25380	RMP7 completed	0%	0		22-Feb-24		20-May-24	69	[Gantt bars for A25380]											
Main Portal Area - Trees Planting in Portion 6A, 7																				
A20250	Planting - Portion 6A	0%	30	23-Feb-24	28-Mar-24	23-Oct-24	26-Nov-24	197	[Gantt bars for A20250]											
A20260	Planting - Portion 7	0%	30	02-Apr-24	08-May-24	27-Nov-24	03-Jan-25	197	[Gantt bars for A20260]											
Main Portal Area - Surface Drainage																				
A10640	RMP7 - 300dia & 450dia U-channel	0%	30	04-Sep-24	10-Oct-24	27-Nov-24	03-Jan-25	69	[Gantt bars for A10640]											
A10660	SMP5 - 300 & 375 dia U-channel	0%	52	05-Jul-24	03-Sep-24	25-Sep-24	26-Nov-24	69	[Gantt bars for A10660]											
Noise Barrier NB4																				
NB4 - Design of Noise Barrier																				
A10190	Noise Barrier NB4 - design preparation	100%	0	09-Sep-21 A	16-Feb-22 A				[Gantt bars for A10190]											
A10200	Noise Barrier NB4 - design approval	100%	0	17-Feb-22 A	28-Feb-22 A				[Gantt bars for A10200]											
NB4 - Procurement of Noise Barrier Panels																				
A10230	Noise Barrier NB4 - panel procurement	100%	0	01-Mar-22 A	01-Apr-22 A				[Gantt bars for A10230]											
NB4 - Construction of Noise Barrier																				
A10210	[Summary] Noise Barrier NB4 - construct footing and wall (6 bays)	100%	0	05-Jan-22 A	11-Apr-22 A				[Gantt bars for A10210]											

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart (2021-2027)												
									2021			2022			2023			2024			2025
A10210-010	Noise Barrier NB4 - underground utilities detection and trial pit	100%	0	05-Jan-22 A	12-Jan-22 A				[Gantt bar: 05-Jan-22 A to 12-Jan-22 A]												
A10210-020	Noise Barrier NB4 - install ELS	100%	0	13-Jan-22 A	27-Jan-22 A				[Gantt bar: 13-Jan-22 A to 27-Jan-22 A]												
A10210-030	Noise Barrier NB4 - excavation	100%	0	28-Jan-22 A	19-Feb-22 A				[Gantt bar: 28-Jan-22 A to 19-Feb-22 A]												
A10210-040	Noise Barrier NB4 - setting out and blinding layer	100%	0	21-Feb-22 A	21-Feb-22 A				[Gantt bar: 21-Feb-22 A to 21-Feb-22 A]												
A10210-050	Noise Barrier NB4 - construct footings [6 bays @4d/bay]	100%	0	22-Feb-22 A	09-Mar-22 A				[Gantt bar: 22-Feb-22 A to 09-Mar-22 A]												
A10210-060	Noise Barrier NB4 - construct wall [6 bays@5d/bay]	100%	0	10-Mar-22 A	04-Apr-22 A				[Gantt bar: 10-Mar-22 A to 04-Apr-22 A]												
A10210-070	Noise Barrier NB4 - install base plate and grouting	100%	0	05-Apr-22 A	06-Apr-22 A				[Gantt bar: 05-Apr-22 A to 06-Apr-22 A]												
A10210-080	Noise Barrier NB4 - install structural steel frame	100%	0	07-Apr-22 A	11-Apr-22 A				[Gantt bar: 07-Apr-22 A to 11-Apr-22 A]												
A10220	Noise Barrier NB4 - install acoustic panel	100%	0	12-Apr-22 A	16-Apr-22 A				[Gantt bar: 12-Apr-22 A to 16-Apr-22 A]												
Effluent Pipelines and Connection Chamber																					
THEEs Tunnel - MS Submission for Pre-Construction Condition Survey to Existing THEEs Tunnel																					
A17212	THEEs Tunnel - Condition Survey - Method statement preparation & submission	100%	0	19-Aug-21 A	19-Oct-21 A				[Gantt bar: 19-Aug-21 A to 19-Oct-21 A]												
A17222	THEEs Tunnel - Condition Survey - MS Approval period	100%	0	20-Oct-21 A	22-Nov-21 A				[Gantt bar: 20-Oct-21 A to 22-Nov-21 A]												
A17224	THEEs Tunnel - Condition Survey - Consent from DSD for access into THEEs Tunnel	100%	0	08-Nov-21 A	28-Nov-21 A				[Gantt bar: 08-Nov-21 A to 28-Nov-21 A]												
A17232	THEEs Tunnel - Condition survey for THEEs tunnel ----- (1st entrance, 4 weeks) -----	100%	0	29-Nov-21 A	30-Nov-21 A				[Gantt bar: 29-Nov-21 A to 30-Nov-21 A]												
Effluent Pipeline - ELS construction																					
A17245	Effluent Pipe - MD(Ch100 - 123) - MAT Junction 4 blasting works complete	100%	0		19-Apr-22 A				[Gantt bar: 19-Apr-22 A to 19-Apr-22 A]												
Effluent Pipeline - Chamber Retaining Wall RWC1																					
A10380	Effluent Pipe - Connection Chamber RWC1 - Excavation	0%	6	05-Aug-24	10-Aug-24	11-Aug-25	16-Aug-25	298	[Gantt bar: 05-Aug-24 to 10-Aug-24]												
A10390	Effluent Pipe - Connection Chamber RWC1 - Footing & wall	0%	18	12-Aug-24	31-Aug-24	18-Aug-25	06-Sep-25	298	[Gantt bar: 12-Aug-24 to 31-Aug-24]												
A17292	Effluent Pipe - Connection Chamber RWC1 - structure complete	0%	0		31-Aug-24		06-Sep-25	298	[Gantt bar: 31-Aug-24 to 06-Sep-25]												
Effluent Pipeline - Chamber Retaining Wall RWC2																					
A10400	Effluent Pipe - Connection Chamber RWC2 - Excavation for RWC2	0%	6	05-Jan-23	11-Jan-23	11-Jan-24	17-Jan-24	298	[Gantt bar: 05-Jan-23 to 11-Jan-23]												
A10410	Effluent Pipe - Connection Chamber RWC2 - Footing & wall for RWC2	0%	24	12-Jan-23	15-Feb-23	18-Jan-24	21-Feb-24	298	[Gantt bar: 12-Jan-23 to 15-Feb-23]												
A10415	ELS works for RWC2 - pipe pile (15nos)	100%	0	05-Aug-22 A	08-Sep-22 A				[Gantt bar: 05-Aug-22 A to 08-Sep-22 A]												
A10420	ELS works for RWC2 - Prebored H pile (17nos)	45.59%	37	30-Aug-22 A	19-Nov-22	30-Dec-22	18-Feb-23	69	[Gantt bar: 30-Aug-22 A to 19-Nov-22]												
A10430	RWC2 remaining wall and roof structure	0%	50	02-Sep-24	01-Nov-24	08-Sep-25	07-Nov-25	298	[Gantt bar: 02-Sep-24 to 01-Nov-24]												
A17300	Effluent Pipe - Connection Chamber RWC2 - structure complete	0%	0		01-Nov-24		07-Nov-25	298	[Gantt bar: 01-Nov-24 to 07-Nov-25]												
Effluent Pipeline - TBM Tunneling and Pipe Jacking																					
A17254	Effluent Pipe - TBM Set up for E101	0%	45	16-Feb-23	13-Apr-23	22-Feb-24	18-Apr-24	298	[Gantt bar: 16-Feb-23 to 13-Apr-23]												
A17260	Effluent Pipe - Pipe Jacking and install pipe for E101 (Ch718 - 386; @2m/d)	0%	166	14-Apr-23	01-Nov-23	19-Apr-24	06-Nov-24	298	[Gantt bar: 14-Apr-23 to 01-Nov-23]												
A17263	Effluent Pipe - MD(Ch123 - 213) localize benching blasting for retrieval of TBM near MD/BD4 junction 4 completed	0%	5	27-Oct-23	01-Nov-23	01-Nov-24	06-Nov-24	298	[Gantt bar: 27-Oct-23 to 01-Nov-23]												
A17265	Effluent Pipe - TBM for E101 - disassembly/ retrieval	0%	24	02-Nov-23	29-Nov-23	07-Nov-24	04-Dec-24	298	[Gantt bar: 02-Nov-23 to 29-Nov-23]												
A17270	Effluent Pipe - TBM Set up for E201	0%	30	30-Nov-23	06-Jan-24	05-Dec-24	11-Jan-25	298	[Gantt bar: 30-Nov-23 to 06-Jan-24]												
A17280	Effluent Pipe - Pipe Jacking and install pipe for E201 (Ch718 - 386 @2m/d)	0%	166	08-Jan-24	03-Aug-24	13-Jan-25	09-Aug-25	298	[Gantt bar: 08-Jan-24 to 03-Aug-24]												
Effluent Pipeline - Modification of Connection Chamber																					
A17330	Effluent Pipe - Connection Chamber - THEES connection ready to start	0%	0	02-Nov-24		08-Nov-25		182	[Gantt bar: 02-Nov-24 to 08-Nov-25]												

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart											
									2021		2022		2023		2024		2025		2026	
A11510	Rigid Barrier RB1 - Maintenance staircase - RB1	0%	24	20-Apr-23	18-May-23	11-Apr-23	09-May-23	-8												
A11520	Rigid Barrier RB1 - Hand rail - RB1	0%	18	19-May-23	09-Jun-23	10-May-23	31-May-23	-8												
Secondary Portal Area - Flexible Barrier																				
Secondary Portal Area - Flexible Barrier - Design & Procurement																				
A11530	Flexible Barrier - Flexible barrier design preparation	100%	0	10-Feb-22 A	19-Mar-22 A															
A11540	Flexible Barrier - Flexible barrier design approval	100%	0	21-Mar-22 A	07-Apr-22 A															
Secondary Portal Area - Flexible Barrier - Construction and Installation																				
A11560-005	Site clearance & access formation for RB1 & FB	100%	0	22-Apr-22 A	05-Aug-22 A															
A11580	Flexible Barrier - Material ordering period	61.47%	42	02-Aug-22 A	18-Nov-22	22-Dec-22	01-Feb-23	75												
A11582	Flexible Barrier material testing	0%	21	19-Nov-22	13-Dec-22	02-Feb-23	25-Feb-23	55												
A11890	Flexible Barrier installation	0%	75	14-Dec-22	21-Mar-23	27-Feb-23	31-May-23	55												
Secondary Portal Area - Soldier Pile Wall SP1																				
A11200	Soldier Pile Wall SP1 - Prebored H-pile - Mobilization	0%	12	19-Nov-22	02-Dec-22	30-Jun-23	14-Jul-23	175												
A11210	Soldier Pile Wall SP1 - Prebored H-pile SP1-16 [16 nos.; 1 rig]	0%	48	03-Dec-22	07-Feb-23	15-Jul-23	08-Sep-23	175												
A11220	Soldier Pile Wall SP1 - Prebored H-pile SP17-32 [16 nos.; 1 rig]	0%	48	08-Feb-23	04-Apr-23	09-Sep-23	07-Nov-23	175												
A11230	Soldier Pile Wall SP1 - Mass concrete end and Capping Beam - SP1	0%	20	06-Apr-23	03-May-23	18-Nov-23	11-Dec-23	184												
A11240	Soldier Pile Wall SP1 - Skin wall - SP1	0%	45	04-May-23	27-Jun-23	12-Dec-23	05-Feb-24	184												
Secondary Portal Area - Soldier Pile Wall SP2																				
A11245	Soldier Pile Wall SP2 - Removal of Existing CLP OHL cable and poles - by CLP	100%	0	09-Sep-21 A	13-Oct-21 A															
A11250	Soldier Pile Wall SP2 - Soldier Pile Wall SP2 - Mobilization	0%	12	06-Apr-23	22-Apr-23	08-Nov-23	21-Nov-23	175												
A11260	Soldier Pile Wall SP2 - Prebored H-pile SP1-12 [12 nos.; 1 rig]	0%	36	24-Apr-23	06-Jun-23	22-Nov-23	05-Jan-24	175												
A11270	Soldier Pile Wall SP2 - Mass Concrete end and Capping Beam - SP2	0%	26	07-Jun-23	08-Jul-23	06-Jan-24	05-Feb-24	175												
A11280	Soldier Pile Wall SP2 - Skin wall - SP2	0%	38	10-Jul-23	22-Aug-23	06-Feb-24	27-Mar-24	175												
Secondary Portal Area - Retaining Wall RW1																				
A11160	RW1 - ELS for RW1	0%	30	23-Aug-23	26-Sep-23	28-Mar-24	07-May-24	175												
A11170	RW1 - Excavation for RW1	0%	12	27-Sep-23	12-Oct-23	08-May-24	22-May-24	175												
A11180	RW1 - RW1 footing and wall	0%	30	13-Oct-23	17-Nov-23	23-May-24	27-Jun-24	175												
A11190	RW1 - Backfill of RW1	0%	12	18-Nov-23	01-Dec-23	28-Jun-24	12-Jul-24	175												
Secondary Portal Area - Slope SSP1 - Cut Slope and Soil Nail (+76mPD to +13.5mPD)																				
Secondary Portal Area - Trees at Slope SSP1																				
A11565	SSP1 - Tree Survey	100%	0	19-Aug-21 A	30-Sep-21 A															
A11570	SSP1 - Tree felling	100%	0	27-May-22 A	12-Aug-22 A															
A11590	SSP1 - Transplant of existing flora species	100%	0	19-Aug-21 A	25-Oct-21 A															
A11880	SSP1 - Planting at Portion 10	0%	30	17-Jun-24	22-Jul-24	06-Jun-24	12-Jul-24	-8												
Slope SSP1 - (+76mPD to +43.5mPD)																				
A10690	Slope SSP1 [CE003] - Excavation (71- 67mpd)	0%	7	10-Jun-23	17-Jun-23	01-Jun-23	08-Jun-23	-8												
A10700	Slope SSP1 [CE003] - Soil Nail at 69mpd - (R1 - R4) - 4 nos.	0%	4	19-Jun-23	23-Jun-23	09-Jun-23	13-Jun-23	-8												

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	2021												2022												2023												2024												2025												2026												2027																																																																							
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A10710	Slope SSP1 [CE003] - Soil Nail at 67mpd - (Q1 - Q8) - 8 nos.	0%	6	24-Jun-23	30-Jun-23	14-Jun-23	20-Jun-23	-8																																																																																																																																																
A10720	Slope SSP1 [CE003] - Excavation (67 -63.5mpd)	0%	5	03-Jul-23	07-Jul-23	21-Jun-23	27-Jun-23	-8																																																																																																																																																
A10730	Slope SSP1 [CE003] - Soil Nail at 65mpd - (P1 - P12) - 12 nos.	0%	6	08-Jul-23	14-Jul-23	28-Jun-23	05-Jul-23	-8																																																																																																																																																
A10740	Slope SSP1 [CE003] - Excavation (63.5- 59.5mpd)	0%	5	15-Jul-23	20-Jul-23	06-Jul-23	11-Jul-23	-8																																																																																																																																																
A10750	Slope SSP1 [CE003] - Soil Nail at 61.5mpd - (O1 - O25) - 25 nos.	0%	9	21-Jul-23	31-Jul-23	12-Jul-23	21-Jul-23	-8																																																																																																																																																
A10760	Slope SSP1 [CE003] - Soil Nail at 59.5mpd - (N1 - N32) - 32 nos.	0%	14	01-Aug-23	16-Aug-23	22-Jul-23	07-Aug-23	-8																																																																																																																																																
A10770	Slope SSP1 [CE003] - Excavation (59.5 -56mpd)	0%	5	17-Aug-23	22-Aug-23	08-Aug-23	12-Aug-23	-8																																																																																																																																																
A10780	Slope SSP1 [CE003] - Soil Nail at 57.5mpd - (M1 - M42) - 42 nos.	0%	15	23-Aug-23	08-Sep-23	14-Aug-23	30-Aug-23	-8																																																																																																																																																
A10790	Slope SSP1 [CE003] - Excavation (56- 52mpd)	0%	5	09-Sep-23	14-Sep-23	31-Aug-23	05-Sep-23	-8																																																																																																																																																
A10800	Slope SSP1 [CE003] - Soil Nail at 54mpd - (L1 - L55) - 55 nos.	0%	17	15-Sep-23	06-Oct-23	06-Sep-23	25-Sep-23	-8																																																																																																																																																
A10810	Slope SSP1 [CE003] - Soil Nail at 52mpd - (K1 - K62) - 62 nos.	0%	13	07-Oct-23	21-Oct-23	26-Sep-23	12-Oct-23	-8																																																																																																																																																
A10820	Slope SSP1 [CE003] - Excavation (52 -48.5mpd)	0%	5	24-Oct-23	28-Oct-23	13-Oct-23	18-Oct-23	-8																																																																																																																																																
A10830	Slope SSP1 [CE003] - Soil Nail at 50mpd - (J1 - J67) - 67 nos.	0%	18	30-Oct-23	18-Nov-23	19-Oct-23	09-Nov-23	-8																																																																																																																																																
Slope SSP1 - (+48.5mPD to +35.5mPD)																																																																																																																																																								
A10840	Slope SSP1 [CE003] - Excavation (48.5- 44.5mpd)	0%	5	20-Nov-23	24-Nov-23	10-Nov-23	15-Nov-23	-8																																																																																																																																																
A10850	Slope SSP1 [CE003] - Soil Nail at 46.5mpd - (I1 - I74) - 74 nos.	0%	20	25-Nov-23	18-Dec-23	16-Nov-23	08-Dec-23	-8																																																																																																																																																
A10860	Slope SSP1 [CE003] - Soil Nail at 44.5mpd - (H1 - H76) - 76 nos.	0%	20	19-Dec-23	13-Jan-24	09-Dec-23	04-Jan-24	-8																																																																																																																																																
A10870	Slope SSP1 [CE003] - Excavation (44.5 -41mpd)	0%	5	15-Jan-24	19-Jan-24	05-Jan-24	10-Jan-24	-8																																																																																																																																																
A10880	Slope SSP1 [CE003] - Soil Nail at 42.5mpd - (G1 - G77) - 77 nos.	0%	20	20-Jan-24	19-Feb-24	11-Jan-24	02-Feb-24	-8																																																																																																																																																
A10890	Slope SSP1 - Excavation (41 -33.5mpd)	0%	5	20-Feb-24	24-Feb-24	03-Feb-24	08-Feb-24	-8																																																																																																																																																
Slope SSP1 - (35.5mPD to 13.5mPD)																																																																																																																																																								
A10900	Slope SSP1 - Excavation (33.5 -26mpd)	0%	5	26-Feb-24	01-Mar-24	09-Feb-24	21-Feb-24	-8																																																																																																																																																
A10910	Slope SSP1 - Excavation (26- 22mpd)	0%	5	02-Mar-24	07-Mar-24	22-Feb-24	27-Feb-24	-8																																																																																																																																																
A10920	Slope SSP1 - Soil Nail at 25mpd - (F1-16)- 16nos	0%	4	08-Mar-24	12-Mar-24	28-Feb-24	02-Mar-24	-8																																																																																																																																																
A10930	Slope SSP1 - Soil Nail at 23mpd - (E1-18)- 18nos	0%	5	13-Mar-24	18-Mar-24	04-Mar-24	08-Mar-24	-8																																																																																																																																																
A10940	Slope SSP1 - Excavation (22 -19.5mpd)	0%	5	19-Mar-24	23-Mar-24	09-Mar-24	14-Mar-24	-8																																																																																																																																																
A10950	Slope SSP1 - Soil Nail at 21mpd - (D1-17)- 17nos	0%	5	25-Mar-24	02-Apr-24	15-Mar-24	20-Mar-24	-8																																																																																																																																																
A10960	Slope SSP1 - Excavation (19.5- 15.5mpd)	0%	5	03-Apr-24	09-Apr-24	21-Mar-24	26-Mar-24	-8																																																																																																																																																
A10970	Slope SSP1 - Soil Nail at 18mpd - (C1-18)- 18nos	0%	5	10-Apr-24	15-Apr-24	27-Mar-24	05-Apr-24	-8																																																																																																																																																
A10980	Slope SSP1 - Soil Nail at 16.5mpd - (B1-20)- 20nos	0%	5	16-Apr-24	20-Apr-24	06-Apr-24	11-Apr-24	-8																																																																																																																																																
A10990	Slope SSP1 - Excavation (16 -12.8mpd)	0%	5	22-Apr-24	26-Apr-24	12-Apr-24	17-Apr-24	-8																																																																																																																																																
A11000	Slope SSP1 - Soil Nail at 15mpd - (A1-18)- 18nos	0%	5	27-Apr-24	03-May-24	18-Apr-24	23-Apr-24	-8																																																																																																																																																
A11010	Slope SSP1 - Excavation (26- 22mpd)	0%	5	02-Mar-24	07-Mar-24	23-Feb-24	28-Feb-24	-7																																																																																																																																																
A11020	Slope SSP1 - Soil Nail at 25mpd - (F17-60)- 44nos	0%	11	08-Mar-24	20-Mar-24	29-Feb-24	12-Mar-24	-7																																																																																																																																																
A11030	Slope SSP1 - Soil Nail at 23mpd - (E19-62)- 44nos	0%	11	21-Mar-24	06-Apr-24	13-Mar-24	25-Mar-24	-7																																																																																																																																																
A11040	Slope SSP1 - Excavation (22 -19.5mpd)	0%	5	08-Apr-24	12-Apr-24	26-Mar-24	03-Apr-24	-7																																																																																																																																																
A11050	Slope SSP1 - Soil Nail at 21mpd - (D18-60)- 43nos	0%	11	13-Apr-24	25-Apr-24	05-Apr-24	17-Apr-24	-7																																																																																																																																																

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart																	
									2021			2022			2023			2024			2025			2026		
									J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
SAT - Excavation (Ch156 - Ch160)																										
A11850	SAT - Long Canopy Tube (Ch156 - 160)	0%	2	31-Oct-22	01-Nov-22	25-Aug-23	26-Aug-23	239																		
A11860	SAT - Tunnel excavation (Ch156 - 160)	0%	10	02-Nov-22	12-Nov-22	28-Aug-23	07-Sep-23	239	█																	
A11870	SAT - Steel rib & Shortcrete installation (Ch156 - 160)	0%	10	03-Nov-22	14-Nov-22	29-Aug-23	08-Sep-23	239	█																	
SAT - Blast Door Installation																										
A20090	SAT - Blast Door installation at SAT	20%	36	26-Sep-22 A	18-Nov-22	19-Apr-24	01-Jun-24	446	█																	
SAT - Excavation (Ch160 - Ch164)																										
A19820	SAT - Long Canopy Tube (Ch160 - 164)	0%	2	15-Nov-22	16-Nov-22	09-Sep-23	11-Sep-23	239																		
A19830	SAT - Tunnel excavation (Ch160 - 164)	0%	10	17-Nov-22	28-Nov-22	12-Sep-23	22-Sep-23	239	█																	
A19840	SAT - Steel rib & Shortcrete installation (Ch160 - 164)	0%	10	18-Nov-22	29-Nov-22	13-Sep-23	23-Sep-23	239	█																	
SAT - Excavation (Ch164 - Ch168)																										
A19850	SAT - Probing and PEG (4nos.,30m)	0%	1	30-Nov-22	30-Nov-22	25-Sep-23	25-Sep-23	239																		
A19860	SAT - Long Canopy Tube (Ch164 - 168)	0%	2	01-Dec-22	02-Dec-22	26-Sep-23	27-Sep-23	239																		
A19870	SAT - Tunnel excavation (Ch164 - 168)	0%	10	03-Dec-22	14-Dec-22	28-Sep-23	11-Oct-23	239	█																	
A19880	SAT - Steel rib & Shortcrete installation (Ch164 - 168)	0%	10	05-Dec-22	15-Dec-22	29-Sep-23	12-Oct-23	239	█																	
SAT - Excavation (Ch168 - Ch172)																										
A19890	SAT - Long Canopy Tube (Ch168 - 172)	0%	2	16-Dec-22	17-Dec-22	13-Oct-23	14-Oct-23	239																		
A19900	SAT - Tunnel excavation (Ch168 - 172)	0%	10	19-Dec-22	31-Dec-22	16-Oct-23	27-Oct-23	239	█																	
A19910	SAT - Steel rib & Shortcrete installation (Ch168 - 172)	0%	10	20-Dec-22	03-Jan-23	17-Oct-23	28-Oct-23	239	█																	
SAT - Excavation (Ch172 - Ch176)																										
A19920	SAT - Long Canopy Tube (Ch172 - 176)	0%	2	04-Jan-23	05-Jan-23	30-Oct-23	31-Oct-23	239																		
A19930	SAT - Tunnel excavation (Ch172 - 176)	0%	10	06-Jan-23	17-Jan-23	01-Nov-23	11-Nov-23	239	█																	
A19940	SAT - Steel rib & Shortcrete installation (Ch172 - 176)	0%	10	07-Jan-23	18-Jan-23	02-Nov-23	13-Nov-23	239	█																	
SAT - Excavation (Ch176 - Ch184)																										
A19950	SAT - Long Canopy Tube (Ch176 - 184)	0%	2	19-Jan-23	20-Jan-23	14-Nov-23	15-Nov-23	239																		
A19960	SAT - Tunnel excavation (Ch176 - 184)	0%	20	28-Jan-23	20-Feb-23	16-Nov-23	08-Dec-23	239	█																	
A19970	SAT - Steel rib & Shortcrete installation (Ch176 - 184)	0%	20	30-Jan-23	21-Feb-23	17-Nov-23	09-Dec-23	239	█																	
SAT - Hard Rock Excavation (Drill & Blast) (Ch187 - 388) - Top Heading																										
A19980	SAT - Soft ground excavation complete	0%	0		21-Feb-23		09-Dec-23	239	◆																	
B10000	SAT - Blasting work ready to start	0%	0	19-Dec-22		11-Oct-23		235	◆																	
B10010	SAT - Top heading (Ch187 - 208, 21m, 5 nos. blast)	0%	10	25-Apr-23	06-May-23	05-Feb-24	22-Feb-24	235	█																	
B10020	SAT - Top heading (Ch208 - 268, 60m, 16 nos. blast)	0%	32	14-Mar-23	24-Apr-23	28-Dec-23	03-Feb-24	235	█																	
B10030	SAT - Top heading (Ch268 - 328, 60m, 16 nos. blast)	0%	32	04-Feb-23	13-Mar-23	18-Nov-23	27-Dec-23	235	█																	
B10040	SAT - Top heading (Ch328 - 388, 60m, 16 nos. blast)	0%	32	19-Dec-22	03-Feb-23	11-Oct-23	17-Nov-23	235	█																	
B10050	SAT - Top Heading Permanent Sprayed Concrete	0%	30	08-May-23	12-Jun-23	17-May-24	21-Jun-24	301	█																	
SAT - Hard Rock Excavation (Drill & Blast) (Ch187 - 388) - Bottom Bench																										
B10060	SAT - Bottom bench (Ch187 - 208, 21m, 3 nos. blast)	0%	6	31-Aug-23	06-Sep-23	22-Jun-24	28-Jun-24	235																		

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart (2021-2027)											
									2021	2022	2023	2024	2025	2026	2027					
B10070	SAT - Bottom bench (Ch208 - 268, 60m, 16 nos. blast)	0%	32	25-Jul-23	30-Aug-23	14-May-24	21-Jun-24	235												
B10080	SAT - Bottom bench (Ch268 - 328, 60m, 16 nos. blast)	0%	32	15-Jun-23	24-Jul-23	05-Apr-24	13-May-24	235												
B10090	SAT - Bottom bench (Ch328 - 388, 60m, 16 nos. blast)	0%	32	08-May-23	14-Jun-23	23-Feb-24	03-Apr-24	235												
B10100	SAT - Bottom bench Permanent Bolt & Permanent Sprayed Concrete	0%	30	07-Sep-23	13-Oct-23	29-Jun-24	03-Aug-24	235												
B10110	SAT - Rock Plug by Mechanical Break, 3m (Ch184-187)	0%	5	14-Oct-23	19-Oct-23	05-Aug-24	09-Aug-24	235												
SAT - Permanent Lining																				
A12202	SAT - Design submission of permanent lining formwork	0%	45	08-Oct-22	29-Nov-22	21-Aug-23	13-Oct-23	254												
A12204	SAT - Design approval of permanent lining formwork	0%	18	30-Nov-22	20-Dec-22	14-Oct-23	04-Nov-23	254												
A12206	SAT - Permanent lining formwork fabrication and delivery	0%	30	21-Dec-22	03-Feb-23	06-Nov-23	09-Dec-23	254												
A12210	SAT - Make good shotcrete, blinding & preparation works	0%	18	22-Feb-23	14-Mar-23	11-Dec-23	03-Jan-24	239												
A12220	[Summary] SAT - Construct Permanent Lining with base slab (Ch140-160)-Type 19b	0%	90	15-Mar-23	06-Jul-23	04-Jan-24	29-Apr-24	239												
A12220-10	SAT - Construct Permanent Lining with base slab (Ch140-150) Type 19b	0%	45	15-Mar-23	11-May-23	04-Jan-24	02-Mar-24	239												
A12220-20	SAT - Construct Permanent Lining with base slab (Ch150-160) Type 19b	0%	45	12-May-23	06-Jul-23	04-Mar-24	29-Apr-24	239												
A12230	[Summary] SAT - Construct Permanent Lining with base slab (Ch160-184)-Type 19b	0%	90	07-Jul-23	21-Oct-23	18-Jun-24	22-Oct-24	293												
A12230-10	SAT - Construct Permanent Lining with base slab (Ch160-172)-Type 19b	0%	45	07-Jul-23	28-Aug-23	18-Jun-24	09-Aug-24	278												
A12230-20	SAT - Construct Permanent Lining with base slab (Ch172-184)-Type 19b	0%	45	29-Aug-23	21-Oct-23	28-Aug-24	22-Oct-24	293												
A12330	SAT - construct Portal structure - Type 19a	0%	60	07-Jul-23	14-Sep-23	30-Apr-24	12-Jul-24	239												
SAT - Overhead Ventilation Duct, Protected Corridor																				
A17020	SAT - Internal Structure - (SD, Ch380-420) - internal r.c structure	0%	35	20-Oct-23	30-Nov-23	10-Aug-24	20-Sep-24	235												
A17030	SAT - Internal Structure - (SD, Ch340-380) - internal r.c structure	0%	35	01-Dec-23	13-Jan-24	21-Sep-24	02-Nov-24	235												
A17040	SAT - Internal Structure - (SD, Ch300-340) - internal r.c structure	0%	35	15-Jan-24	01-Mar-24	09-Nov-24	19-Dec-24	240												
A17050	SAT - Internal Structure - (SD, Ch260-300) - internal r.c structure	0%	35	02-Mar-24	16-Apr-24	20-Dec-24	08-Feb-25	240												
A17060	SAT - Internal Structure - (SD, Ch220-260) - internal r.c structure	0%	35	17-Apr-24	29-May-24	10-Mar-25	23-Apr-25	264												
A17070	SAT - Internal Structure - (SD, Ch180-220) - internal r.c structure	0%	35	30-May-24	11-Jul-24	24-Apr-25	06-Jun-25	264												
A17080	SAT - Internal Structure - (SD, Ch140-180) - internal r.c structure	0%	35	12-Jul-24	21-Aug-24	07-Jun-25	18-Jul-25	264												
A18610	SAT - OHVD - (SD, Ch380-420) - install OHVD precast slab	0%	60	13-Jun-24	22-Aug-24	04-Nov-24	15-Jan-25	119												
A18612	SAT - OHVD - (SD, Ch260-380) - install OHVD precast slab	0%	60	23-Aug-24	04-Nov-24	21-Jan-25	08-Apr-25	123												
A25040	SAT - OHVD - (SD, Ch180-260) - install OHVD precast slab	0%	55	05-Nov-24	10-Jan-25	14-May-25	18-Jul-25	148												
SAT - Ground Water Drainage																				
A20640	SAT - Ground Water Drainage - (SD, Ch380-420)	0%	20	23-Aug-24	14-Sep-24	16-Jan-25	14-Feb-25	119												
A20650	SAT - Ground Water Drainage - (SD, Ch340-380)	0%	20	16-Sep-24	10-Oct-24	20-Feb-25	14-Mar-25	123												
A20660	SAT - Ground Water Drainage - (SD, Ch300-340)	0%	20	12-Oct-24	04-Nov-24	20-Mar-25	12-Apr-25	127												
A20670	SAT - Ground Water Drainage - (SD, Ch260-300)	0%	20	05-Nov-24	27-Nov-24	22-Apr-25	16-May-25	131												
A20680	SAT - Ground Water Drainage - (SD, Ch220-260)	0%	20	28-Nov-24	20-Dec-24	22-May-25	14-Jun-25	135												
A20690	SAT - Ground Water Drainage - (SD, Ch180-220)	0%	20	21-Dec-24	16-Jan-25	20-Jun-25	14-Jul-25	139												
A20700	SAT - Ground Water Drainage - (SD, Ch140-180)	0%	20	17-Jan-25	15-Feb-25	19-Jul-25	11-Aug-25	143												
SAT - Waste Water Drainage																				

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart												
									2021	2022	2023	2024	2025	2026	2027						
Cavern Complex - Temporary Power Supply for Tunneling Works																					
A12510	Cavern Complex - Power & water supply for Tunnel work	100%	0	18-Sep-21 A	21-Jan-22 A																
Cavern Complex - Conveyor Belt System																					
A12610	Prepare detail method statement for Conveyor belt system erection	0%	30	08-Oct-22	11-Nov-22	13-Jun-23	19-Jul-23	197													
A12620	PM approval	0%	21	12-Nov-22	06-Dec-22	20-Jul-23	12-Aug-23	197													
A12640	Submit application and obtain consent from HyD, TD consent for bridge over across Mui Tsz Lam road	0%	180	12-Nov-22	28-Jun-23	20-Jul-23	28-Feb-24	197													
A12645	Submit application and obtain consent from EPD	0%	90	12-Nov-22	07-Mar-23	06-Nov-23	28-Feb-24	287													
A12650	Submit application and obtain consent from MTRC	0%	180	12-Nov-22	28-Jun-23	20-Jul-23	28-Feb-24	197													
A12655	Submit application and obtain consent from DSD for Sea wall modification	0%	180	12-Nov-22	28-Jun-23	20-Jul-23	28-Feb-24	197													
A12660	Coordinate with Utility company for cable diversion under MOS rail	0%	60	12-Nov-22	31-Jan-23	11-Dec-23	28-Feb-24	317													
A12665	Obtain consent from all relevant authority	0%	0		28-Jun-23		28-Feb-24	197													
A12670	CLP 11kv Cable diversion	0%	170	29-Jun-23	20-Jan-24	29-Feb-24	24-Sep-24	197													
A12680	TGT Telecom cable diversion	0%	90	22-Jan-24	18-May-24	25-Sep-24	13-Jan-25	197													
A12690	Piling work from MAT(E) to MTR (Mui Tsz Lam Road section)	0%	60	21-Feb-24	06-May-24	06-Dec-24	24-Feb-25	237													
A12700	Piling Work under MOS rail bridge section	0%	30	20-May-24	24-Jun-24	14-Jan-25	24-Feb-25	197													
A12710	Conveyor Belt Structure work erection	0%	75	25-Jun-24	21-Sep-24	25-Feb-25	29-May-25	197													
A12720	Conveyor E&M Work installation	0%	90	23-Sep-24	10-Jan-25	30-May-25	13-Sep-25	197													
A12730	Conveyor Belt System ready to use	0%	0		10-Jan-25		13-Sep-25	197													
A12740	Demolish Conveyor Belt System	0%	90	11-Jan-25	09-May-25	15-Sep-25	03-Jan-26	197													
Cavern Complex - Boulder Survey																					
A12445	Blasting Permit - Boulder survey & condition survey	100%	0	11-Aug-21 A	10-Sep-21 A																
Cavern Complex - CBAR1 Blasting Permit																					
A12450	CBAR 1 Blasting Permit - Update BAR (Blasting Assessment Report) - preparation and submission	100%	0	02-Aug-21 A	16-Sep-21 A																
A12465	CBAR1 - Summary of Blasting Permit Application	100%	0	02-Aug-21 A	27-Jan-22 A																
A12470	CBAR 1 Blasting Permit - Prepare and submit CBAR1 to PM	100%	0	02-Aug-21 A	04-Sep-21 A																
A12470-100	CBAR 1 Blasting Permit - PM comment to CBAR1 & submit to Mines & GEO	100%	0	04-Sep-21 A	17-Sep-21 A																
A12470-110	CBAR1 Blasting Permit - GEO & Mines review CBAR1	100%	0	17-Sep-21 A	17-Oct-21 A																
A12470-120	CBAR1 Blasting Permit - response GEO & Mines comments via PM	100%	0	17-Oct-21 A	04-Nov-21 A																
A12470-130	CBAR1 Blasting Permit - closing out GEO & Mines comments	100%	0	11-Nov-21 A	14-Dec-21 A																
A12480	CBAR1 Blasting Permit - pre-licencing inspection, preparation, interview contractor & consultant and issue Permit	100%	0	05-Jan-22 A	24-Jan-22 A																
A12490	CBAR1 Blasting Permit - order explosive (2 days before blasting)	100%	0	25-Jan-22 A	27-Jan-22 A																
Cavern Complex - CBAR1 Blasting Method Statement																					
A12454	CBAR1 - Summary of Blasting Method Statement (BMS) Submission and approval	100%	0	19-Aug-21 A	13-Jan-22 A																
A12460	CBAR1 Blasting Method Statement (BMS) - Prepare & submit to PM	100%	0	19-Aug-21 A	21-Oct-21 A																
A12460-100	CBAR1 Blasting Method Statement (BMS) - response to PM's comments	100%	0	21-Oct-21 A	27-Oct-21 A																
A12460-110	CBAR1 Blasting Method Statement (BMS) - Formal submit BMS to Mines	100%	0	28-Oct-21 A	29-Oct-21 A																
A12460-120	CBAR1 Blasting Method Statement (BMS) - Mines review BMS	100%	0	30-Oct-21 A	26-Nov-21 A																

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart											
									2021	2022	2023	2024	2025	2026	2027					
A12460-130	CBAR1 Blasting Method Statement (BMS) - response Mines comments on BMS	100%	0	27-Nov-21 A	13-Jan-22 A															
Cavern Complex - CBAR1 Blasting Door Design and Installation																				
A12461	CBAR1 - Summary of Blast Door Design Submission and Installation for CBAR1	100%	0	18-Sep-21 A	05-Jan-22 A															
A12462	CBAR1 Blast Door - Blast Door Design preparation & submission	100%	0	18-Sep-21 A	22-Oct-21 A															
A12464	CBAR1 Blast Door - Blast Door Design reviewed by PM	100%	0	23-Oct-21 A	30-Nov-21 A															
A12466	CBAR1 Blast Door - Blast Door material delivery, on site fabrication & installation	100%	0	15-Nov-21 A	05-Jan-22 A															
Cavern Complex - CBAR1 Tunnel Temporary Works Design																				
A23040	CBAR1 Tunnel Temporary Work Design - prepare and submit to PM	100%	0	07-Sep-21 A	22-Oct-21 A															
A23050	CBAR1 Tunnel Temporary Work Design - PM review and comment	100%	0	23-Oct-21 A	01-Nov-21 A															
A24412	CBAR1 Tunnel Temporary Work Design - response to PM's comment & PM accept	100%	0	01-Nov-21 A	15-Dec-21 A															
Cavern Complex - CBAR2 Blasting Permit																				
A21350	==== CBAR2 - Summary of Blasting Permit Application ====	100%	0	08-Nov-21 A	24-Jun-22 A															
A21351	CBAR2 Blasting Permit - Prepare and submit draft of CBAR2 to PM	100%	0	08-Nov-21 A	16-Dec-21 A															
A21352	CBAR2 Blasting Permit - PM comment to CBAR2 & submit to Mines & GEO	100%	0	17-Dec-21 A	26-Jan-22 A															
A21354	CBAR2 Blasting Permit - GEO & Mines review CBAR2	100%	0	26-Jan-22 A	18-Mar-22 A															
A21356	CBAR2 Blasting Permit - response GEO & Mines comments via PM	100%	0	27-Feb-22 A	19-Mar-22 A															
A21366	CBAR2 Blasting Permit - close out comments from GEO & Mines	100%	0	21-Mar-22 A	23-May-22 A															
A21370	CBAR2 Blasting Permit - pre-licencing inspection, preparation and issue Permit	100%	0	24-May-22 A	21-Jun-22 A															
A21380	CBAR2 Blasting Permit - order explosive (2 days before blasting)	100%	0	22-Jun-22 A	24-Jun-22 A															
A25390	CBAR2B Blasting Permit - Prepare CBar2B and Submit to GEO & Mines	100%	0	18-May-22 A	07-Jul-22 A															
A25400	CBAR2B Blasting Permit - GEO & Mines review CBAR2B	100%	0	08-Jul-22 A	12-Aug-22 A															
A25410	CBAR2B Blasting Permit - response GEO & Mines comments via PM	100%	0	13-Aug-22 A	17-Aug-22 A															
A25420	CBAR2B Blasting Permit - CBar2B approval from GEO & Mines	100%	0	18-Aug-22 A	23-Aug-22 A															
Cavern Complex - CBAR2 Blasting Method Statement																				
A21390	[TG] CBAR2 - Summary of Blasting Method Statement (BMS) Submission and approval	100%	0	18-Feb-22 A	01-Jun-22 A															
A21400	CBAR2 Blasting Method Statement (BMS) - Prepare & submit to PM	100%	0	18-Feb-22 A	24-Mar-22 A															
A21402	CBAR2 Blasting Method Statement (BMS) - PM review and comment	100%	0	25-Mar-22 A	04-Apr-22 A															
A21410	CBAR2 Blasting Method Statement (BMS) - response to PM's comments	100%	0	06-Apr-22 A	19-Apr-22 A															
A21420	CBAR2 Blasting Method Statement (BMS) - formal submit BMS to Mines	100%	0	20-Apr-22 A	26-Apr-22 A															
A21430	CBAR2 Blasting Method Statement (BMS) - Mines review BMS	100%	0	27-Apr-22 A	20-May-22 A															
A21440	CBAR2 Blasting Method Statement (BMS) - response Mines comments on BMS	100%	0	21-May-22 A	01-Jun-22 A															
A25430	CBAR2B Blasting Permit - BMS Prepare & Submit	100%	0	30-Jun-22 A	02-Aug-22 A															
A25440	CBAR2B Blasting Permit - BMS comment from Mines	100%	0	18-Aug-22 A	24-Aug-22 A															
A25450	CBAR2B Blasting Permit - BMS response to Mines comment	100%	0	25-Aug-22 A	26-Aug-22 A															
A25460	CBAR2B Blasting Permit - BMS mines approval	100%	0		26-Aug-22 A															
A25470	CBAR2B Blasting Permit - pre-licencing inspection, preparation and issue Permit	100%	0	29-Aug-22 A	30-Aug-22 A															
A25480	CBAR2B Blasting Permit - order explosive (2 days before blasting)	100%	0	31-Aug-22 A	01-Sep-22 A															

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	2021												2022												2023												2024												2025												2026												2027																																																																							
									A												J												J												A												M												J												J												A												S																																															
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Main Access Tunnel, MAT (ch288 - 297)																																																																																																																																																								
MAT - Hard Rock Excavation (Drill & Blast) - Top Heading																																																																																																																																																								
A12530	Cavern Complex - start possession to Portion 9, Part of Portion 2 & Part of Portion 6A	100%	0	20-Jan-22 A					◆																																																																																																																																															
P14240	MAT - Access to the Main Access Tunnel to commenct work	100%	0	19-Jan-22 A					◆																																																																																																																																															
P14242	MAT - form temporary platform for Top Heading Blasting	100%	0	19-Jan-22 A	20-Jan-22 A																																																																																																																																																			
P14244	MAT - Top Heading - (R103, Ch288.6 - 296.6) - 8m, 4 nos. Blasts @2m Pull length, 455m3 each	100%	0	21-Jan-22 A	10-Feb-22 A				■																																																																																																																																															
PA14400	MAT - Top Permanent Support - (R103, Ch288 - 297) - Bolt and spray concrete [8m] - Stage 1	100%	0	22-Jan-22 A	19-Apr-22 A				■																																																																																																																																															
PA14401	MAT - Top Permanent Support - (R103, Ch288 - 297) - Bolt and spray concrete [8m]- stage 2	0%	12	08-Oct-22	21-Oct-22	21-Oct-23	04-Nov-23	305	■																																																																																																																																															
MAT - Hard Rock Excavation (Drill & Blast) - Bottom Bench																																																																																																																																																								
P13890	MAT - Access Allocation for Bench Excavation	0%	10	18-Jul-23	28-Jul-23	06-Nov-23	16-Nov-23	92																																																																																																																																																
PA14410	MAT - Bottom Permanent Support - (R103, Ch288 - 297) - Bolt and spray concrete [9m]	0%	12	18-Jul-23	31-Jul-23	06-Nov-23	18-Nov-23	92																																																																																																																																																
PA14412	MAT - Bench - (R103, Ch288.6 - 296.6, 8m) - 1 no. Blasts, 408m3 each	0%	2	29-Jul-23	31-Jul-23	17-Nov-23	18-Nov-23	92																																																																																																																																																
MAT - Permanent Lining																																																																																																																																																								
A12570	MAT - Lining - (R103, Ch288 - 297)	0%	24	19-Aug-24	14-Sep-24	13-Jun-25	11-Jul-25	237	■																																																																																																																																															
MAT - Overhead Ventilation Duct, Protected Corridor																																																																																																																																																								
A16590	MAT - Internal Structure - (R103, Ch260 - 296) - internal r.c structure	0%	30	07-Oct-24	11-Nov-24	12-Jul-25	15-Aug-25	221	■																																																																																																																																															
A18630	MAT - OHVD - (R103, Ch260 - 296) - install OHVD precast slab	0%	30	12-Nov-24	16-Dec-24	16-Aug-25	19-Sep-25	221	■																																																																																																																																															
MAT - Ground Water Drainage																																																																																																																																																								
A20630	MAT - Ground Water Drainage - (R103, Ch260 - 296) - construct manhole & pipe	0%	20	17-Dec-24	11-Jan-25	20-Sep-25	15-Oct-25	221	■																																																																																																																																															
MAT - Emergency Bypass																																																																																																																																																								
A17200	MAT - Emergency Bypass - (R103, Ch288 - 297) - Floor slab and Step	0%	40	23-Nov-24	11-Jan-25	28-Aug-25	15-Oct-25	221	■																																																																																																																																															
MAT - Waste Water Drainage																																																																																																																																																								
A17460	MAT - Waste Water Drainage - (R103, Ch260 - 296) - construct u-channel, pipe, MH	0%	18	13-Jan-25	08-Feb-25	16-Oct-25	06-Nov-25	221	■																																																																																																																																															
MAT - Sewage Rising Mains																																																																																																																																																								
A17850	MAT - Sewage Rising Mains - (R103, Ch260 - 296) - install rising mains	0%	18	30-Apr-25	22-May-25	07-Nov-25	27-Nov-25	157	■																																																																																																																																															
MAT - Road Works																																																																																																																																																								
A18220	MAT - Road Works - (R103, Ch206 - 296) - roadwork including U-channel	0%	18	20-Jun-25	11-Jul-25	28-Nov-25	18-Dec-25	134	■																																																																																																																																															
A18240	MAT - Pavement - (R103, Ch260 - 296) - pavement work	0%	5	12-Jul-25	17-Jul-25	19-Dec-25	24-Dec-25	134																																																																																																																																																
Main Driveway MD																																																																																																																																																								
Main Driveway MD - Zone 1 (ch123 - 213)																																																																																																																																																								
MD - Zone 1 - Hard Rock Excavation (Drill & Blast) - Top Heading																																																																																																																																																								
P10325-10	MD - Junction 4 - Top Heading - (R105, Ch100 - 123) - 5 nos. Blasts @3m Pull length	100%	0	29-Mar-22 A	19-Apr-22 A				■																																																																																																																																															
P10325-20	MD - Junction 4 - Top Heading - (R105, Ch100 - 123) - remaining work	0%	60	13-Oct-22	21-Dec-22	20-Aug-24	31-Oct-24	543	■																																																																																																																																															
P10330	MD - Zone 1 - Top Heading - (R105, Ch122.9 to 149.9) - 27m, 6 nos. Blasts @3m Pull length, 672m3 each	100%	0	22-Apr-22 A	14-May-22 A				■																																																																																																																																															
P10340	MD - Zone 1 - Top Heading - (R105, Ch149.9 to 155.0) - 5.1m, 1 no. Blast @5.5m Pull length, 1210m3 each	100%	0	18-May-22 A	18-May-22 A																																																																																																																																																			
P10350	MD - Zone 1 - Top Heading - (R105, Ch155.0 to 180.0) - 25m, 5 nos. Blasts @5.5m Pull length, 1210m3 each	100%	0	21-May-22 A	06-Jun-22 A				■																																																																																																																																															
P10360	MD - Zone 1 - Top Heading - (R105, Ch180.0 to 200.6) - 20.6m, 4 nos. Blasts @5.5m Pull length, 1210m3 each	100%	0	07-Jun-22 A	16-Jun-22 A																																																																																																																																																			

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	2021												2022												2023												2024												2025												2026												2027																																																																							
									A												J												J												A												J												J												A												J																																																											
MD - Zone 2 - Emergency Bypass																																																																																																																																																								
A17210	MD - Zone 2 - Emergency Bypass - (MD, Ch213-243) - Emergency Bypass Floor slab and Step	0%	24	12-Feb-25	11-Mar-25	21-Jun-25	19-Jul-25	104																																																																																																																																																
A20960	MD - Zone 2 - Emergency Bypass - (MD, Ch243-283) - Emergency Bypass Floor slab and Step	0%	24	12-Mar-25	09-Apr-25	21-Jul-25	16-Aug-25	104																																																																																																																																																
A20970	MD - Zone 2 - Emergency Bypass - (MD, Ch283-323) - Emergency Bypass Floor slab and Step	0%	24	10-Apr-25	13-May-25	18-Aug-25	13-Sep-25	104																																																																																																																																																
A20980	MD - Zone 2 - Emergency Bypass - (MD, Ch323-353) - Emergency Bypass Floor slab and Step	0%	24	14-May-25	11-Jun-25	15-Sep-25	14-Oct-25	104																																																																																																																																																
A20990	MD - Zone 2 - Emergency Bypass - (MD, Ch353-391) - Emergency Bypass Floor slab and Step	0%	24	12-Jun-25	10-Jul-25	15-Oct-25	12-Nov-25	104																																																																																																																																																
MD - Zone 2 - Waste Water Drainage																																																																																																																																																								
A17500	MD - Zone 2 - Waste Water Drainage - (MD, Ch213-243) - construct manholes, pipe and u-channel	0%	20	01-Mar-25	24-Mar-25	19-Jul-25	11-Aug-25	112																																																																																																																																																
A17510	MD - Zone 2 - Waste Water Drainage - (MD, Ch243-283) - construct manholes, pipe and u-channel	0%	18	25-Mar-25	15-Apr-25	12-Aug-25	01-Sep-25	112																																																																																																																																																
A17520	MD - Zone 2 - Waste Water Drainage - (MD, Ch283-323) - construct manholes, pipe and u-channel	0%	18	16-Apr-25	12-May-25	02-Sep-25	22-Sep-25	112																																																																																																																																																
A17530	MD - Zone 2 - Waste Water Drainage - (MD, Ch323-353) - construct manholes, pipe and u-channel	0%	18	13-May-25	03-Jun-25	23-Sep-25	15-Oct-25	112																																																																																																																																																
A17540	MD - Zone 2 - Waste Water Drainage - (MD, Ch353-391) - construct manholes, pipe and u-channel	0%	18	11-Jul-25	31-Jul-25	13-Nov-25	03-Dec-25	104																																																																																																																																																
MD - Zone 2 - Sewage Rising Mains																																																																																																																																																								
A17900	MD - Zone 2 - Sewage Rising Mains - (MD, Ch213-243) - install rising mains	0%	18	25-Mar-25	15-Apr-25	12-Aug-25	01-Sep-25	112																																																																																																																																																
A17910	MD - Zone 2 - Sewage Rising Mains - (MD, Ch243-283) - install rising mains	0%	18	16-Apr-25	12-May-25	02-Sep-25	22-Sep-25	112																																																																																																																																																
A17920	MD - Zone 2 - Sewage Rising Mains - (MD, Ch283-323) - install rising mains	0%	18	13-May-25	03-Jun-25	23-Sep-25	15-Oct-25	112																																																																																																																																																
A17930	MD - Zone 2 - Sewage Rising Mains - (MD, Ch323-353) - install rising mains	0%	18	04-Jun-25	24-Jun-25	16-Oct-25	06-Nov-25	112																																																																																																																																																
A17940	MD - Zone 2 - Sewage Rising Mains - (MD, Ch353-391) - install rising mains	0%	18	14-Jul-25	02-Aug-25	27-Nov-25	17-Dec-25	114																																																																																																																																																
MD - Zone 2 - Road Work																																																																																																																																																								
A18260	MD - Zone 2 - Road Works including U-channel - (MD - Ch213-323)	0%	35	13-May-25	23-Jun-25	24-Sep-25	06-Nov-25	113																																																																																																																																																
A18270	MD - Zone 2 - Road Works including U-channel - (MD - Ch323-391)	0%	35	05-Jul-25	14-Aug-25	07-Nov-25	17-Dec-25	104																																																																																																																																																
A18280	MD - Zone 2 - Pavement - (MD - Ch213-391)	0%	12	15-Aug-25	28-Aug-25	18-Dec-25	03-Jan-26	104																																																																																																																																																
Main Driveway MD - Zone 3 (ch408 - 480)																																																																																																																																																								
MD - Zone 3 - Hard Rock Excavation (Drill & Blast) - Top Heading																																																																																																																																																								
PA14540	MD - Zone 3 - Top Permanent Support - (MD, ch408 - 480) - Bolt and spray concrete [72m] - Stage 1	0%	32	30-Dec-22	13-Feb-23	29-Apr-23	07-Jun-23	92																																																																																																																																																
PA14541	MD - Zone 3 - Top Permanent Support - (MD, ch408 - 480) - Bolt and spray concrete [72m] - Stage 2	0%	36	07-Feb-23	20-Mar-23	10-Jan-24	27-Feb-24	275																																																																																																																																																
MD - Zone 3 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)																																																																																																																																																								
P12410	MD - Zone 3 - Side Heading 1 - (R105, Ch408.8 to 421.2) - 12.4m, 5 nos. Blasts @3m Pull length, 351m3 each	0%	5	30-Dec-22	05-Jan-23	29-Apr-23	05-May-23	92																																																																																																																																																
P12420	MD - Zone 3 - Side Heading 1 - (R105, Ch421.2 to 449.3) - 28.2m, 10 nos. Blasts @3m Pull length, 351m3 each	0%	10	06-Jan-23	17-Jan-23	06-May-23	17-May-23	92																																																																																																																																																
P12430	MD - Zone 3 - Side Heading 1 - (R105, Ch449.3 to 479.3) - 29.9m, 10 nos. Blasts @3m Pull length, 351m3 each	0%	10	18-Jan-23	04-Feb-23	18-May-23	30-May-23	92																																																																																																																																																
MD - Zone 3 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)																																																																																																																																																								
P12590	MD - Zone 3 - Side Heading 2 - (R105, Ch408.8 to 421.2) - 12.4m, 5 nos. Blasts @3m Pull length, 234m3 each	0%	5	31-Dec-22	06-Jan-23	02-May-23	06-May-23	92																																																																																																																																																
P12600	MD - Zone 3 - Side Heading 2 - (R105, Ch421.2to 449.3) - 28.2m, 10 nos. Blasts @3m Pull length, 234m3 each	0%	10	07-Jan-23	18-Jan-23	08-May-23	18-May-23	92																																																																																																																																																
P12610	MD - Zone 3 - Side Heading 2 - (R105, Ch449.3 to 479.3) - 29.9m, 10 nos. Blasts @3m Pull length, 234m3 each	0%	10	19-Jan-23	06-Feb-23	19-May-23	31-May-23	92																																																																																																																																																
MD - Zone 3 - Hard Rock Excavation (Drill & Blast) - Bottom Bench																																																																																																																																																								
P13940	MD - Zone 3 - Bench - (R105, Ch408.8 to 421.2) - 12.4m,@1.5m Pull length, 16 nos. Blasts	0%	16	02-Nov-23	20-Nov-23	28-Feb-24	16-Mar-24	92																																																																																																																																																
P13950	MD - Zone 3 - Bench - (R105, Ch421.2 to 449.3) - 28.2m, @1.5m Pull length, 38 nos. Blasts,	0%	38	21-Nov-23	06-Jan-24	18-Mar-24	06-May-24	92																																																																																																																																																

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart																				
									2021			2022			2023			2024			2025			2026			2027		
									A	J	J	A	J	J	A	J	J	A	J	J	A	J	J	A	J	J	A	J	J
BD3 - Hard Rock Excavation (Drill & Blast) - Top Heading																													
P12200	BD3 - Top Head - (Ch124.0 - 127.5) - 3.5m, 1 no. Blast @5.5m Pull length, 708m3 each	100%	0	01-Sep-22 A	03-Sep-22 A																								
P12210-1	BD3 - Top Head - (Ch127.5 - 150) - 22.5m	100%	0	08-Sep-22 A	22-Sep-22 A					■																			
P12210-2	BD3 - Top Head - (Ch150 - 180) - 30x11m, 6 nos blasts (Junction at CAV1)	73.33%	4	23-Sep-22 A	12-Oct-22	18-Apr-23	21-Apr-23	151	■																				
P12210-3	BD3 - Top Head - (Ch180 - 205) - 25m	0%	9	13-Oct-22	22-Oct-22	22-Apr-23	03-May-23	151	■																				
P12210-4	BD3 - Top Head - (Ch205 - 235) - 30x11m, 6 nos blasts (Junction at CAV2)	0%	27	24-Oct-22	23-Nov-22	04-May-23	05-Jun-23	151	■																				
P12210-5	BD3 - Top Head - (Ch235 - 258.5) - 23.5m	0%	8	24-Nov-22	02-Dec-22	06-Jun-23	14-Jun-23	151	■																				
P12220	BD3 - Top Head - (Ch259 - 262) - 3m	0%	5	03-Dec-22	08-Dec-22	15-Jun-23	20-Jun-23	151	■																				
P12230-1	BD3 - Top Head - (Ch292 - 315) - 23m	0%	15	09-Dec-22	28-Dec-22	21-Jun-23	10-Jul-23	151	■																				
P12230-2	BD3 - Top Head - (Ch315 - 345) - 30x11m, 2 nos blasts with CAV4	0%	4	29-Dec-22	03-Jan-23	11-Jul-23	14-Jul-23	151	■																				
P12230-3	BD3 - Top Head - (Ch345 - 370) - 25m	0%	15	04-Jan-23	20-Jan-23	15-Jul-23	01-Aug-23	151	■																				
P12230-4	BD3 - Top Head - (Ch370 - 400) - 30x11m, 2 nos blasts with CAV5	0%	4	12-Jan-23	16-Jan-23	01-Mar-24	05-Mar-24	329	■																				
P12230-5	BD3 - Top Head - (Ch400 - 420) - 20m	0%	12	28-Jan-23	10-Feb-23	02-Aug-23	15-Aug-23	151	■																				
P12240	BD3 - Top Head - (Ch420 - 430.0) - 10.1m, 2 nos. Blasts @5.5m Pull length, 1408m3 each	0%	4	11-Feb-23	15-Feb-23	16-Aug-23	19-Aug-23	151	■																				
P12250	BD3 - Top Head - (Ch430.0 to 443.5) - 13.5m, 3 nos. Blasts @5m Pull length	0%	4	21-Nov-22	24-Nov-22	03-Mar-23	07-Mar-23	79	■																				
P12490	BD3 - Achievement of KD2	0%	0		11-Mar-23		13-Sep-23	151	◆																				
PA14440	BD3 - Top Permanent Support - Bolt and spray concrete - Stage 1	18.25%	103	08-Sep-22 A	15-Feb-23	19-Aug-23	19-Aug-23	151	■																				
PA14440-10	BD3 - Top Permanent Support - Bolt and spray concrete (Part 1 of 3) [96.5m] - Stage 2	0%	49	16-Feb-23	18-Apr-23	21-Oct-23	18-Dec-23	202	■																				
PA14440-20	BD3 - Top Permanent Support - Bolt and spray concrete (Part 2 of 3) [96.5m] - Stage 2	0%	49	19-Apr-23	16-Jun-23	19-Dec-23	23-Feb-24	202	■																				
PA14440-30	BD3 - Top Permanent Support - Bolt and spray concrete (Part 3 of 3) [96.5m] - Stage 2	0%	49	17-Jun-23	15-Aug-23	24-Feb-24	25-Apr-24	202	■																				
PA14440-40	BD3 - Trim Blast	0%	98	16-Feb-23	16-Jun-23	21-Oct-23	23-Feb-24	202	■																				
BD3 - Trimming Blast Excavation above MD - Top Heading																													
P14521	BD3 - Top Head trimming blast - (Ch138 - 100) - m, 7 no. Blast @5.5m Pull length, 500m3 each	0%	21	16-Feb-23	11-Mar-23	21-Aug-23	13-Sep-23	151	■																				
BD3 - Hard Rock Excavation (Drill & Blast) - Bottom Bench																													
P12260	BD3 - Bench - (Ch100.0 - 124.0) - 24m, 4 nos. Blasts, 1367m3 each	0%	12	18-Sep-23	03-Oct-23	26-Apr-24	10-May-24	174	■																				
P12270	BD3 - Bench - (Ch124.0 - 127.5) - 3.5m, 1 no. Blast, 355m3 each	0%	2	04-Oct-23	05-Oct-23	11-May-24	13-May-24	174	■																				
P12280	BD3 - Bench - (Ch127.5 - 258.5) - 131m, 24 nos Blasts, 678m3 each	0%	48	06-Oct-23	01-Dec-23	14-May-24	11-Jul-24	174	■																				
P12290	BD3 - Bench - (Ch258.5 - 262.0) - 3.5m, 1 no. Blast, 355m3 each	0%	2	02-Dec-23	04-Dec-23	12-Jul-24	13-Jul-24	174	■																				
P12300	BD3 - Bench - (Ch292.0 - 419.9) - 127.9m, 23 nos. Blasts, 678m3 each	0%	46	05-Dec-23	30-Jan-24	15-Jul-24	05-Sep-24	174	■																				
P12310	BD3 - Bench - (Ch419.9 - 430.0) - 10.1m, 2 nos. Blasts, 703m3 each	0%	4	31-Jan-24	03-Feb-24	06-Sep-24	10-Sep-24	174	■																				
P12320	BD3 - Bench - (Ch430.0 - 443.5) - 13.5m, 2 nos. Blasts, 1560m3 each	0%	12	05-Feb-24	24-Feb-24	11-Sep-24	25-Sep-24	174	■																				
PA14450	Permanent Support (Bolt and spray concrete) (BD3 - Bottom) - Stage 1	0%	114	04-Oct-23	24-Feb-24	11-May-24	25-Sep-24	174	■																				
PA14920-10	BD3 - Bottom Permanent Support (Bolt and spray concrete) (BD3 - Bottom) (Part 1 of 2) [172m] - Stage 2	0%	43	26-Feb-24	19-Apr-24	15-Nov-24	07-Jan-25	215	■																				
PA14920-20	BD3 - Bottom Permanent Support (Bolt and spray concrete) (BD3 - Bottom) (Part 2 of 2) [172m] - Stage 2	0%	43	20-Apr-24	12-Jun-24	05-Feb-26	02-Apr-26	532	■																				
BD3 - Overhead Ventilation Duct, Protected Corridor and Emergency Bypass																													
A16805	Stage 2 Blasting work complete - BD3, BD2, MD(Ch226-391), MBBR1-4,STC, SD(Ch518-675)	0%	0		02-Jul-24		07-Jan-25	156	◆																				
A16810	BD3 - Internal Structure - (Ch150 - 190) - internal r.c structure	0%	52	03-Jul-24	31-Aug-24	08-Jan-25	15-Mar-25	156	■																				

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart (2021-2027)											
									2021	2022	2023	2024	2025	2026	2027					
P11240	CAV2 - PST2 - Bench - (PST2, Ch155.0 to 130.5) - 24.5m, 4 nos. Blasts, 574 m3 each	0%	4	08-Jan-24	11-Jan-24	27-Nov-24	30-Nov-24	261												
P11250	CAV2 - PST2 - Bench - (PST2, Ch130.5 to 114.8) - 15.8m, 3 nos. Blasts, 574 m3 each	0%	3	12-Jan-24	15-Jan-24	02-Dec-24	04-Dec-24	261												
P11260	CAV2 - PST2 - Bench - (PST2, Ch114.8 to 100.0) - 14.8m, 3 nos. Blasts, 1748 m3 each	0%	6	16-Jan-24	22-Jan-24	05-Dec-24	11-Dec-24	261												
PA14670	CAV2 - PST2 - Bottom Permanent Support - Bolt and spray concrete [68m]- Stage 1	0%	21	05-Jan-24	29-Jan-24	25-Nov-24	18-Dec-24	261												
PA14671	CAV2 - PST2 - Bottom Permanent Support - Bolt and spray concrete [68m]- Stage 2	0%	17	23-Jan-24	17-Feb-24	12-Dec-25	03-Jan-26	554												
Cavern 3 - ELC2, STC, ELC1																				
Cavern 3 - ELC2																				
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading																				
PA14680	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete- Stage 1	38.67%	46	01-Sep-22 A	30-Nov-22	24-May-23	24-May-23	136												
PA14680-10	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete (Part 1 of 4) [22.6m]- Stage 2	0%	12	01-Dec-22	14-Dec-22	08-Mar-24	21-Mar-24	368												
PA14680-20	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete (Part 2 of 4) [22.6m]- Stage 2	0%	12	15-Dec-22	30-Dec-22	22-Mar-24	09-Apr-24	368												
PA14680-30	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete (Part 3 of 4) [22.6m]- Stage 2	0%	12	31-Dec-22	14-Jan-23	10-Apr-24	23-Apr-24	368												
PA14680-40	CAV3 - ELC2 - Top Permanent Support - Bolt and spray concrete (Part 4 of 4) [22.6m]- Stage 2	0%	12	16-Jan-23	04-Feb-23	24-Apr-24	08-May-24	368												
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)																				
P12760	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch190.2 to 184.5) - 5.7m, 1 nos. Blasts @5.5 Pull length, 861m3 each	100%	0	01-Sep-22 A	03-Sep-22 A															
P12770	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch184.5 to 113.0) - 71.5m, 13 nos. Blasts @5.5 Pull length, 861m3 each	38.33%	37	08-Sep-22 A	19-Nov-22	27-Mar-23	13-May-23	136												
P12780	CAV3 - ELC2 - Side Heading 1 - (ELC2, Ch113.0 to 100.0) - 13.0m, 3 nos. Blasts @5.5 Pull length, 861m3 each	0%	9	21-Nov-22	30-Nov-22	15-May-23	24-May-23	136												
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Top Heading (2nd Half)																				
P12790	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch190.2 to 184.5) - 5.7m, 1 nos. Blasts @5.5 Pull length, 574m3 each	100%	0	01-Sep-22 A	03-Sep-22 A															
P12800	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch184.5 to 113.0) - 71.5m, 13 nos. Blasts @5.5 Pull length, 574m3 each	38.33%	37	08-Sep-22 A	19-Nov-22	27-Mar-23	13-May-23	136												
P12810	CAV3 - ELC2 - Side Heading 2 - (ELC2, Ch113.0 to 100.0) - 13.0m, 3 nos. Blasts @5.5 Pull length, 574m3 each	0%	9	21-Nov-22	30-Nov-22	15-May-23	24-May-23	136												
Cavern 3 - ELC2 - Hard Rock Excavation (Drill & Blast) - Bottom Bench																				
P14010	CAV3 - ELC2 - Bench - (ELC2, Ch190.2 to 184.5) - 5.7m, 1 nos. Blasts, 1433m3 each	0%	2	27-Oct-23	28-Oct-23	09-May-24	10-May-24	153												
P14020	CAV3 - ELC2 - Bench - (ELC2, Ch184.5 to 113.0) - 71.5m, 13 nos. Blasts, 646m3 each	0%	13	30-Oct-23	13-Nov-23	11-May-24	27-May-24	153												
P14030	CAV3 - ELC2 - Bench - (ELC2, Ch113.0 to 100.0) - 13.0m, 2 nos. Blasts, 646 m3 each	0%	2	14-Nov-23	15-Nov-23	28-May-24	29-May-24	153												
PA14690	CAV3 - ELC2 - Bottom Permanent Support - Bolt and spray concrete [90.2m]- Stage 1	0%	17	27-Oct-23	15-Nov-23	09-May-24	29-May-24	153												
PA14691	CAV3 - ELC2 - Bottom Permanent Support - Bolt and spray concrete [90.2m]- Stage 2	0%	23	16-Nov-23	12-Dec-23	05-Dec-25	03-Jan-26	603												
Cavern 3 - STC																				
Cavern 3 - STC - Hard Rock Excavation (Drill & Blast) - Top Heading																				
PA14700	CAV3 - STC - Top Permanent Support - Bolt and spray concrete - Stage 1	0%	165	01-Dec-22	29-Jun-23	25-May-23	09-Dec-23	136												
PA14700-10	CAV3 - STC - Top Permanent Support - Bolt and spray concrete (Part 1 of 4) [48m] - Stage 2	0%	24	30-Jun-23	28-Jul-23	25-Jan-24	28-Feb-24	172												
PA14700-20	CAV3 - STC - Top Permanent Support - Bolt and spray concrete (Part 2 of 4) [48m] - Stage 2	0%	24	29-Jul-23	25-Aug-23	29-Feb-24	27-Mar-24	172												
PA14700-30	CAV3 - STC - Top Permanent Support - Bolt and spray concrete (Part 3 of 4) [48m] - Stage 2	0%	24	26-Aug-23	22-Sep-23	28-Mar-24	29-Apr-24	172												
PA14700-40	CAV3 - STC - Top Permanent Support - Bolt and spray concrete (Part 4 of 4) [48m] - Stage 2	0%	24	23-Sep-23	24-Oct-23	30-Apr-24	29-May-24	172												
Cavern 3 - STC - Hard Rock Excavation (Drill & Blast) - Top Heading (1st Half)																				
P12830	CAV3 - STC - Side Heading 1 - (STC, Ch292.2 to 282.2) - 10.0m, 2 nos. Blasts @5.5 Pull length	0%	5	01-Dec-22	06-Dec-22	25-May-23	31-May-23	136												
P12840	CAV3 - STC - Side Heading 1 - (STC, Ch282.2 to 269.2) - 13.0m, 3 nos. Blasts @5.5 Pull length	0%	8	07-Dec-22	15-Dec-22	01-Jun-23	09-Jun-23	136												

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart											
									2021	2022	2023	2024	2025	2026	2027					
A18490	SD - Zone 3 - Pavement - (SD, Ch660 - 791)	0%	6	17-Aug-26	22-Aug-26	31-Dec-26	07-Jan-27	112												
Ventilation Shaft and Ventilation Adit																				
Ventilation Shaft (VS)																				
VS - Site Preparation																				
A18540	VS - Boulder survey & condition survey	100%	0	08-Oct-21 A	22-Oct-21 A															
VS - CBAR3 Blasting Permit																				
A18590	[Summary] VS - Blasting Permit/ License - Preparation and submission	100%	0	08-Oct-21 A	13-Dec-21 A															
A18600	[Summary] VS - Blasting Permit License - review by Mines Department & issue Permit/license	67.91%	112	13-Dec-21 A	25-Feb-23	29-May-25	29-May-25	660												
A18650	VS - Blasting Works ready to start	0%	0	19-Jan-23		30-May-25		687												
A23080	VS - CBAR3 Blasting Permit - prepare and submit CBAR3 to PM	100%	0	08-Oct-21 A	13-Nov-21 A															
A23085	VS - CBAR3 Blasting Permit - PM comment to CBAR3	100%	0	14-Nov-21 A	26-Nov-21 A															
A23100	VS - CBAR3 Blasting Permit - response to PM's comments	100%	0	27-Nov-21 A	12-Dec-21 A															
A23105	VS - CBAR3 Blasting Permit - submit CBAR3 to GEO & Mines Division	100%	0	13-Dec-21 A	13-Dec-21 A															
A23106	VS - CBAR3 Blasting Permit - GEO & Mines review CBAR3	100%	0	13-Dec-21 A	14-Jan-22 A															
A23108	VS - CBAR3 Blasting Permit - closing out GEO & Mines comments	73.89%	94	15-Jan-22 A	09-Jan-23	26-Jan-25	29-Apr-25	841												
A23109	VS - CBAR3 Blasting Permit - complete installation of Blast Cover	0%	0		31-Dec-22		29-Apr-25	677												
A23110	VS - CBAR3 Blasting Permit - pre-licencing inspection, preparation, interview contractor & consultant and issue Permit	0%	24	30-Jan-23	25-Feb-23	30-Apr-25	29-May-25	660												
A23120	VS - CBAR3 Blasting Permit - order explosive	0%	2	27-Feb-23	28-Feb-23	30-May-25	02-Jun-25	660												
VS - CBAR3 Blasting Method Statement																				
A18580	[Summary] VS - CBAR3 Method statement for Blasting Works	0%	69	31-Oct-22	28-Jan-23	22-Jan-25	29-Apr-25	660												
A23090	VS - CBAR3 Blasting Method Statement (BMS) - Prepare & submit to PM	0%	21	31-Oct-22*	23-Nov-22	22-Jan-25	21-Feb-25	655												
A23092	VS - CBAR3 Blasting Method Statement (BMS) - PM review and comment	0%	14	16-Nov-22	01-Dec-22	14-Feb-25	01-Mar-25	655												
A23102	VS - CBAR3 Blasting Method Statement (BMS) - response to PM's comments	0%	14	02-Dec-22	17-Dec-22	03-Mar-25	18-Mar-25	655												
A23202	VS - CBAR3 Blasting Method Statement (BMS) - Formal submit BMS to Mines	0%	1	19-Dec-22	19-Dec-22	19-Mar-25	19-Mar-25	655												
A23302	VS - CBAR3 Blasting Method Statement (BMS) - Mines review BMS	0%	28	19-Dec-22	15-Jan-23	19-Mar-25	15-Apr-25	821												
A24402	VS - CBAR3 Blasting Method Statement (BMS) - close out Mines comments and Mines approve	0%	14	16-Jan-23	29-Jan-23	16-Apr-25	29-Apr-25	821												
VS - Off-site Fabrication of Travelling Formworks for Ventilation Shaft																				
A20370	Travelling Formwork - Design preparation, review and accept by PM	0%	40	16-Nov-22	04-Jan-23	03-Apr-25	26-May-25	696												
A20380	Travelling Formwork - Place Order, Factory Fabrication and Delivery	0%	60	05-Jan-23	22-Mar-23	27-May-25	06-Aug-25	696												
A20390	Travelling Formwork - Assembling on site	0%	30	23-Mar-23	02-May-23	07-Aug-25	10-Sep-25	696												
VS - Site Formation Design and Method Statement																				
A14620	VS - Site Formation - Design preparation and submission	100%	0	15-Sep-21 A	30-Oct-21 A															
A14630	VS - Site Formation - PM review design and accept	100%	0	13-Oct-21 A	21-Dec-21 A															
A14640	VS - Site Formation - Method Statement preparation and submission	100%	0	08-Nov-21 A	26-Nov-21 A															
A14650	VS - Site Formation - PM review Method Statement and accept	100%	0	27-Nov-21 A	01-Dec-21 A															
VS - Design and Method Statement of Temp R.C. Wall Construction																				
A24500	VS - Temporary R.C. Wall - Design preparation and submission	100%	0	25-Oct-21 A	08-Nov-21 A															

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart															
									2021			2022			2023			2024			2025		2026	
									Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
A24510	VS - Temporary R.C. Wall - PM review design and comment	100%	0	09-Nov-21 A	15-Nov-21 A				[Gantt bar: Nov 9-15, 2021]															
A24520	VS - Temporary R.C. Wall - address PM's comment and re-submit	100%	0	16-Nov-21 A	26-Nov-21 A				[Gantt bar: Nov 16-26, 2021]															
A24530	VS - Temporary R.C. Wall - PM review design and accept	100%	0	27-Nov-21 A	21-Dec-21 A				[Gantt bar: Nov 27-Dec 21, 2021]															
VS - Design of Protective Enclosure																								
A18560	VS - Protective (Noise) Enclosure - Design preparation and submission	100%	0	01-Sep-21 A	24-Dec-21 A				[Gantt bar: Sep 1-Dec 24, 2021]															
A18562	VS - Protective (Noise) Enclosure - Design review and accept by PM	100%	0	24-Dec-21 A	03-Jan-22 A				[Gantt bar: Dec 24-Jan 3, 2022]															
VS - Design of Blast Cover																								
A24590	VS - Blast Cover - Design preparation and submission	100%	0	08-Nov-21 A	22-Dec-21 A				[Gantt bar: Nov 8-Dec 22, 2021]															
A24600	VS - Blast Cover - PM review and comment	100%	0	22-Dec-21 A	03-Jan-22 A				[Gantt bar: Dec 22-Jan 3, 2022]															
VS - Instrumentation and Monitoring																								
A18660	VS - Vibration monitoring station installation (Portion 11, 12)	100%	0	08-Jul-22 A	23-Jul-22 A				[Gantt bar: Jul 8-Jul 23, 2022]															
A19050	VS - Settlement marker (portion 12, 13A)	100%	0	27-Nov-21 A	01-Dec-21 A				[Gantt bar: Nov 27-Dec 1, 2021]															
VS - Site Formation Works																								
A24480	VS - Site Formation - drive sheetpile	100%	0	01-Dec-21 A	08-Dec-21 A				[Gantt bar: Dec 1-8, 2021]															
A24490	VS - Site Formation - Open cut excavation	100%	0	09-Dec-21 A	14-Jan-22 A				[Gantt bar: Dec 9-Jan 14, 2022]															
VS - Construct Temporary R.C. Wall																								
A24540	VS - Temp R.C. Wall - install dowel bars	100%	0	25-Jan-22 A	27-Jan-22 A				[Gantt bar: Jan 25-27, 2022]															
A24550	VS - Temp R.C. Wall - construct wall (5 pours) (178 to 170mPD)	100%	0	07-Feb-22 A	30-May-22 A				[Gantt bar: Feb 7-May 30, 2022]															
A24560	VS - Temp R.C. Wall - backfill to protective enclosure footing founding level [3.5m thk @150mm/layer]	100%	0	07-Mar-22 A	07-May-22 A				[Gantt bar: Mar 7-May 7, 2022]															
A24570	VS - Temp R.C. Wall - backfill to protective enclosure footing founding level [3.5m thk @150mm/layer]	100%	0	29-Jun-22 A	01-Aug-22 A				[Gantt bar: Jun 29-Aug 1, 2022]															
VS - Erect Noise Barrier																								
A18563	VS - Noise Barrier - subletting period	71.88%	9	08-Sep-22 A	18-Oct-22	16-Dec-24	27-Dec-24	645	[Gantt bar: Sep 8-Oct 18, 2022]															
A18564	VS - Noise Barrier - construct footing	0%	24	19-Oct-22	15-Nov-22	28-Dec-24	25-Jan-25	645	[Gantt bar: Oct 19-Nov 15, 2022]															
A18570	VS - Noise Barrier - construct structural frame	0%	26	16-Nov-22	15-Dec-22	27-Jan-25	04-Mar-25	645	[Gantt bar: Nov 16-Dec 15, 2022]															
A24580	VS - Noise Barrier - install wall and roof panels	0%	18	16-Dec-22	09-Jan-23	05-Mar-25	25-Mar-25	645	[Gantt bar: Dec 16-Jan 9, 2023]															
VS - Erect Blast Cover																								
A24610	VS - Blast Cover - Fabrication	0%	48	19-Oct-22	13-Dec-22	12-Feb-25	09-Apr-25	677	[Gantt bar: Oct 19-Dec 13, 2022]															
A24620	VS - Blast Cover - assembling and install cover	0%	14	14-Dec-22	31-Dec-22	10-Apr-25	29-Apr-25	677	[Gantt bar: Dec 14-Dec 31, 2022]															
VS - Shaft Ventilation																								
A18640	VS - Shaft Ventilation installation	0%	5	10-Jan-23	14-Jan-23	21-May-25	26-May-25	687	[Gantt bar: Jan 10-Jan 14, 2023]															
A18680	VS - Shaft Ventilation T&C	0%	3	16-Jan-23	18-Jan-23	27-May-25	29-May-25	687	[Gantt bar: Jan 16-Jan 18, 2023]															
VS - Hard Rock Excavation (Drill & Blast)																								
A14655	VS - Drill & Break Excavation (170 to 165mPD)	0%	50	10-Jan-23	15-Mar-23	26-Mar-25	29-May-25	645	[Gantt bar: Jan 10-Mar 15, 2023]															
A14658	VS - 1st probing for Blasting Work	0%	2	16-Mar-23	17-Mar-23	30-May-25	02-Jun-25	645	[Gantt bar: Mar 16-Mar 17, 2023]															
A14660	VS - Drill & Blast Excavation & Circular Shoring - (165 - 160.8 mPD, 4.2m deep, 4 blasts)	0%	12	18-Mar-23	31-Mar-23	03-Jun-25	16-Jun-25	645	[Gantt bar: Mar 18-Mar 31, 2023]															
A14670	VS - Drill & Blast Excavation & Circular Shoring - (160.8 - 154 mPD, 6.8m deep, 4 blasts)	0%	12	01-Apr-23	19-Apr-23	17-Jun-25	30-Jun-25	645	[Gantt bar: Apr 1-Apr 19, 2023]															
A14680	VS - Drill & Blast Excavation & Circular Shoring - (154 -145.6 mPD, 8.4m deep, 4 blasts)	0%	12	20-Apr-23	04-May-23	02-Jul-25	15-Jul-25	645	[Gantt bar: Apr 20-May 4, 2023]															

Activity ID	Activity Name	Duration % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Gantt Chart (2021-2027)																																																			
									2021				2022				2023				2024				2025				2026				2027																											
									J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J												
A14682	VS - 2nd probing for Blasting Work	0%	2	05-May-23	06-May-23	16-Jul-25	17-Jul-25	645																																																				
A14720	VS - Drill & Blast Excavation & Circular Shoring - (145.6 -124.8 mpd, 20.8m deep, 8 blasts)	0%	24	08-May-23	05-Jun-23	18-Jul-25	14-Aug-25	645																																																				
A14724	VS - 3rd probing for Blasting Work	0%	2	06-Jun-23	07-Jun-23	15-Aug-25	16-Aug-25	645																																																				
A14728	VS - Drill & Blast Excavation & Circular Shoring - (124.8 - 106.6MPD, 18.2m deep, 7 blasts)	0%	21	08-Jun-23	04-Jul-23	18-Aug-25	10-Sep-25	645																																																				
A14730	[Summary] VS - Lining - Circular Shaft lining construction (50m)	0%	90	05-Jul-23	19-Oct-23	11-Sep-25	30-Dec-25	645																																																				
A14730-10	VS - Lining - Circular Shaft lining construction (25m) (Part 1 of 2)	0%	45	05-Jul-23	25-Aug-23	11-Sep-25	05-Nov-25	645																																																				
A14730-20	VS - Lining - Circular Shaft lining construction (25m) (Part 1 of 2)	0%	45	26-Aug-23	19-Oct-23	06-Nov-25	30-Dec-25	645																																																				
VS - Internal and External Wall & Slab																																																												
A14910	VS - R.C. Structure - Internal Column & Wall (106-126mpd)	0%	40	20-Oct-23	06-Dec-23	31-Dec-25	16-Feb-26	645																																																				
A14920	VS - R.C. Structure - Internal Column & Wall (126-146mpd)	0%	40	07-Dec-23	25-Jan-24	24-Feb-26	14-Apr-26	645																																																				
A14930	VS - R.C. Structure - Internal Column & Wall (146-166mpd)	0%	40	26-Jan-24	19-Mar-24	15-Apr-26	02-Jun-26	645																																																				
A14940	VS - R.C. Structure - Internal Column & Wall (166-182mpd)	0%	40	24-May-24	11-Jul-24	03-Aug-26	17-Sep-26	645																																																				
A14950	VS - R.C. Structure - Internal Column & Wall complete	0%	0		11-Jul-24		17-Sep-26	645																																																				
A14960	VS - R.C. Structure - External Wall (177-182mpd)	0%	50	20-Mar-24	23-May-24	03-Jun-26	01-Aug-26	645																																																				
VS - Ventilation Duct																																																												
A15030	VS - Ventilation Duct - installation start	0%	0	16-Jun-26		18-Sep-26		79																																																				
A15040	[Summary] VS - Ventilation Duct - Install Perforated DO Duct for sludge cavern	0%	90	16-Jun-26	02-Oct-26	18-Sep-26	07-Jan-27	79																																																				
A15040-10	VS - Ventilation Duct - Install Perforated DO Duct for sludge cavern (Part 1 of 2)	0%	45	16-Jun-26	08-Aug-26	18-Sep-26	12-Nov-26	79																																																				
A15040-20	VS - Ventilation Duct - Install Perforated DO Duct for sludge cavern (Part 2 of 2)	0%	45	10-Aug-26	02-Oct-26	13-Nov-26	07-Jan-27	79																																																				
A15050	[Summary] VS - Ventilation Duct - Install Perforated DO Duct for PTW	0%	90	16-Jun-26	02-Oct-26	18-Sep-26	07-Jan-27	79																																																				
A15050-10	VS - Ventilation Duct - Install Perforated DO Duct for PTW (Part 1 of 2)	0%	45	16-Jun-26	08-Aug-26	18-Sep-26	12-Nov-26	79																																																				
A15050-20	VS - Ventilation Duct - Install Perforated DO Duct for PTW (Part 2 of 2)	0%	45	10-Aug-26	02-Oct-26	13-Nov-26	07-Jan-27	79																																																				
A15060	[Summary] VS - Ventilation Duct - Install Perforated DO Duct for PST	0%	90	16-Jun-26	02-Oct-26	18-Sep-26	07-Jan-27	79																																																				
A15060-10	VS - Ventilation Duct - Install Perforated DO Duct for PST (Part 1 of 2)	0%	45	16-Jun-26	08-Aug-26	18-Sep-26	12-Nov-26	79																																																				
A15060-20	VS - Ventilation Duct - Install Perforated DO Duct for PST (Part 2 of 2)	0%	45	10-Aug-26	02-Oct-26	13-Nov-26	07-Jan-27	79																																																				
A15070	[Summary] VS - Ventilation Duct - Install Perforated DO Duct for MBBR, DAF & UV	0%	90	16-Jun-26	02-Oct-26	18-Sep-26	07-Jan-27	79																																																				
A15070-10	VS - Ventilation Duct - Install Perforated DO Duct for MBBR, DAF & UV (Part 1 of 2)	0%	45	16-Jun-26	08-Aug-26	18-Sep-26	12-Nov-26	79																																																				
A15070-20	VS - Ventilation Duct - Install Perforated DO Duct for MBBR, DAF & UV (Part 2 of 2)	0%	45	10-Aug-26	02-Oct-26	13-Nov-26	07-Jan-27	79																																																				
A15080	VS - Ventilation Duct - installation complete	0%	0		02-Oct-26		07-Jan-27	79																																																				
VS - Landscape Works																																																												
A20280	Portion 11 - Landscape Planting	0%	30	10-Aug-26	12-Sep-26	01-Dec-26	07-Jan-27	94																																																				
A20290	Portion 12 - Landscape Planting	0%	30	10-Aug-26	12-Sep-26	01-Dec-26	07-Jan-27	94																																																				
Ventilation Adit (VA)																																																												
VA - CBAR4 Blasting Permit																																																												
A23150	VA - CBAR4 Blasting Permit - prepare and submit draft CBAR4 to PM	0%	24	21-Oct-22	17-Nov-22	04-Feb-23	03-Mar-23	82																																																				
A23170	VA - CBAR4 Blasting Permit - PM review and comment	0%	18	18-Nov-22	08-Dec-22	04-Mar-23	24-Mar-23	82																																																				
A23175	VA - CBAR4 Blasting Permit - response to PM's comment	0%	18	09-Dec-22	31-Dec-22	25-Mar-23	19-Apr-23	82																																																				

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Duration of Measures/ Timing of Completion of Measures	Implementation Agent	Implementation Stages				Relevant Legislation & Guidelines	Milestones of Works
					DS	C	O	DE		
Table 3.5	2.4.1	<p>The rock crushing plant is configured as an enclosed system.</p> <p>Dust collector with dust removal efficiency of 99% will be provided at the exhaust of the rock crusher during rock crushing.</p> <p>Watering will be provided to maintain material in wet condition.</p> <p>Vehicles would be required to pass through the wheel washing facilities provided at site exit.</p>	Rock Crushing Plant / Construction Phase	Contractor	✓	✓		✓	Air Pollution Control Ordinance (APCO)	(3), (4) & (5)
3.8.1	2.4.1	Watering eight times a day on active works areas, exposed areas and unpaved haul roads to reduce dust emission by 87.5%.	All active works areas, exposed areas and unpaved haul roads	Contractor		✓		✓	APCO	(1), (2), (3), (4), (5) & (6)

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3.8.1	2.4.1	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> • Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. 	Construction Sites	Contractor		✓		✓	APCO and Air Pollution Control (Construction Dust) Regulation	(1), (2), (3), (4), (5) & (6)

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		<ul style="list-style-type: none"> Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. Imposition of speed controls for vehicles on site haul roads. Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs. Every stock of more than 20 bags of cement or dry PFA should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. 								

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		<ul style="list-style-type: none"> Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise. 								
3.5.2	-	Sludge tanks with totally enclosed design proven by DSD should be deployed for transporting sludge. With thorough cleaning practice and regular condition test of the sludge tanks, odour emission and leachate leakage during storage and transportation are not anticipated.	Cavern Sewage Treatment Works (CSTW) / Operation Phase	Project Proponent / Operator	✓		✓		-	(7)
3.6.2, 3.7.2	2.4.2	All treatment units with potential odour emission will be covered and the exhausted air will be conveyed to the deodouriser (with 80 – 97% odour removal efficiency) for treatment before discharge to the environment.	CSTW / Operation Phase	Design team / Project Proponent / Operator	✓		✓		-	(7)

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3.7.2	2.4.2	<p>The following appropriate odour control measures would be implemented.</p> <p>(i) Adopting the advantage of caverns as natural barriers for odour control;</p> <p>(ii) Covering up of odour sources;</p> <p>(iii) Preventing odour leakage through the access tunnels by applying negative pressure inside caverns;</p> <p>(iv) Installing deodourizing units to clean up the collected foul air;</p> <p>(v) (v) Discharging exhausted air at height to further enhance the dilution effect; and</p> <p>(vi) Enhancing the odour management of the sludge transportation.</p>	CSTW / Operation Phase	Design team / Project Proponent / Operator	✓		✓		-	(7)

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3.10.2	2.3.1	Odour monitoring at the inlet and outlet of the deodourizing units is proposed to be conducted for first three years of the operation of CSTW, quarterly in the first year, and once every 6 months in the second and third years if monitoring results remain below the limit levels.	CSTW / Operation Phase	Project Proponent / Operator	✓		✓		-	(7)
3.10.2	2.3.2	An Odour Complaint Registration System is also proposed in the EM&A programme to check whether the deodorizing units can fulfill the recommended odour removal performance.	CSTW / Operation Phase	Operator			✓		-	(7)
3.10.2	-	Any unexpected leakage from tanks could be observed with monitoring equipment. Monitoring equipment would be installed in the CSTW to monitor the concentration of H ₂ S, CO and CO ₂ and methane. Investigation and repair works would be carried out immediately if abrupt increase of these concentrations are reported. Emergency Plan would be established for these upset conditions.	CSTW / Operation Phase	Project Proponent / Operator	✓		✓		-	(7)

Notes:

DS: Design; C: Construction; O: Operation; and DE: Decommissioning

(1): General Site Preparation Works; (2): Temporary Explosive Magazine; (3): Main Portal Area and Main Access Tunnel (MAT, MATE, MATW); (4): Secondary Portal Area and Secondary Access Tunnel (SAT); (5): Cavern Complex; (6): Ventilation Shaft and Ventilation Adit; & (7): Establishment Works