ATTACHMENT 13 - APPLICANT AIR QUALITY REPORT

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Welshpool Concrete Batching Plant

Air Quality Modelling

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Approved By	**Martin Parsons**

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A	24th April 2025	Caelan Whiting	Martin Parsons	Initial issue
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MRP Technical Consulting Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Holcim Australia Pty Ltd dated 21 January 2025 and in accordance with our understanding and interpretation of current regulatory standards.

The conclusions presented in this report represent MRP's professional judgement based on information made available during the course of this assignment and are true and correct to the best of MRP's knowledge as at the date of the assessment.

MRP did not independently verify all of the written or oral information provided during the course of this investigation. While MRP has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to MRP was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

This report has been prepared for Holcim Australia Pty Ltd and may not be relied upon by any other person or entity without MRP's express written permission.

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1 Introduction

1.1 Background

Holcim Australia Pty Ltd (Holcim) operates the Welshpool concrete plant located at 12 Cohn Street in Carlisle, 7.5 km from Perth business district centre. The batching plant currently produces up to 110,000 m^3 of concrete products annually. Holcim is proposing to redevelop the Welshpool plant to increase its annual production of concrete products to 300,000 m^3. MRP Technical Consulting Pty Ltd (MRP) were engaged by Holcim to undertake an air quality assessment to support the Development Application associated with this proposed upgrade. This assessment considers:

- Air dispersion modelling of emissions from the current and proposed operations;
- Comparison against relevant ambient air quality criteria; and
- A dust management plan.

1.2 Operational Overview

The concrete production process consists of mixing aggregate (sand, gravel, crushed stone or slag) and slurry (cement plus water) to obtain concrete. The Welshpool concrete plant will receive aggregate from tippers that will unload the aggregate into underground level bins. Cement will be unloaded by tankers through a closed system and stored in elevated silos. The aggregate will pass through weighers and will be transported by conveyor to fully enclosed holding hoppers to be mixed with water and cement into the agitators.

The plant redevelopment of the concrete batching plant will be nominally comprised of:

- Enclosed aggregate bins;
- Enclosed cement silos;
- Underground aggregate hopper;
- Enclosed aggregate silo bins;
- Aggregate weighers; and
- Cement weighers.

1.3 Control and Mitigation Measures

The Welshpool concrete plant redevelopment has been designed to have the following dust control and mitigation measures:

- All areas will be paved and swept regularly;
- Covered conveyors and transfer points to move aggregate to holding hoppers;
- Fully enclosed holding hoppers;
- Enclosed cement loading bay;
- Use of an enclosed pneumatic transfer system for cement unloading into silos with dust extraction;
- Automatic silo fill system that stops if silo becomes full;

- Enclosed aggregate bins;
- Wash out pits for the agitators; and
- Enclosed loading bay with dust extraction system.

1.4 Complaints and Incidents Register

Holcim maintains a complaints and incidents register as part of their ongoing environmental management practices. Since 2012, Holcim has received one verified complaint and had five incidents as a result of dust impacts from operations at the Welshpool facility. A description of the complaint and incidents are provided below.

- **13th of December 2012 –** The cement silo relief valve was activated discharging cement dust into the air. In response, cement discharging was ceased, the silo was checked to confirm if the event was related to overfill and the overfill valves were also checked. The problem was then resolved. No complaints from neighbours were received.
- **27th of November 2015** - Airborne dust was observed exiting the boundary of site from dry aggregate being tipped off. The quarry was contacted to inform them of the incident and watering of aggregate stockpiles and spray bar watering of trucks was increased. No complaints from neighbours were received.
- **24th of January 2018** - Visible dust was observed escaping the GP silo during cement pump up. An investigation found that a filter bag had torn, a spiral duct needed repairs and a solenoid had failed. Repairs were undertaken immediately and the problem resolved. No complaints from neighbours were received.
- **4th of September 2020 –** There was an uncontrolled dust released during a cement blowup, due to hole in the blow-up line resulting in impacts across the Holcim boundary. A road sweeper crew was called to clean neighbouring roads and property. Neighbouring properties were consulted and vouchers were made available to professional car cleaning services where required. The hole in the blow up line was subsequently repaired.
- **9th of August 2024** - Dust was observed escaping from the top of the silo & down the breather pipe while a cement tanker was pumping off-slag. The transport supervisor contacted the batch plant to report there was dust escaping from the top of the silo and where the tanker was pumping off. The production officer went to investigate but the pump off had completed. Fitters were called to investigate the cause of dust escaping (checking filter for holes / blockages and found the silo top filter had a hole. The filter was subsequently replaced. No complaints from neighbours were received.
- **5th of September 2024** - Details of a complaint relate to a cement tanker discharging slag which was asked to stop discharging to allow maintenance to the silo filter. It is believed the shutdown procedure wasn't followed correctly which resulted in over pressure causing damage to the cement line consequently resulting in discharge of cement which was carried across the site boundary. Impacts from the dust were reported by a neighbour. The tanker was immediately shut down, the site was cleaned up and the tanker was sent for repair.

All of the complaints and incidents were related to upset conditions not considered to be a part of normal operations and were quickly resolved. No other verified complaints have been received, which would suggest that existing controls have generally been effective in mitigating nuisance air quality impacts on nearby sensitive receptors.

1.5 Nearest receptors

The closest sensitive receptor is located within 10m to the north-west of the plant boundary (Figure 1-1).

Figure 1-1: Welshpool Concrete Site Location

2 Air Quality Criteria

Particulate matter (PM) is generally defined as particles that can remain suspended in the air by turbulence for an appreciable length of time. PM can consist of a range of matter including crustal material, pollens, sea salts and smoke from combustion products. PM is commonly defined by the size of the particles including the following:

- Total suspended particulates (TSP), which is all particulate matter with an equivalent aerodynamic particle diameter below 50 µm diameter;
- PM_{10} is particulate matter below 10 µm in equivalent aerodynamic diameter; and
- $PM_{2.5}$ is particulate matter below 2.5 µm in equivalent aerodynamic diameter.

TSP contains PM_{10} and $PM_{2.5}$ fractions and is normally associated with amenity and nuisance impacts. PM_{10} and $PM_{2.5}$ are generally associated with the potential for health impacts as particles this size and below may enter the lungs. This study has focussed on predicted ambient air quality concentrations of PM_{10} and $PM_{2.5}$ and deposition of TSP.

Table 2-1 contains the relevant criteria for particulate matter. The standards are based on the following guidelines:

- National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) by the National Environment Protection Council (NEPC, 2021) noting that a proposed variation to the $PM_{2.5}$ standards has recently come into effect as of January 2025;
- Guideline – Dust Emissions - Draft for external consultation by the Department of Water and Environmental Regulation (DWER, 2021).
- Guideline – Air emissions – Draft for external consultation by the Department of Water and Environmental Regulation (DWER, 2019).

Table 2-1: Relevant Air Quality Standards

Pollutant	Averaging Period	Unit[1]	Ambient Air Concentration Standard	Reference
Particles as PM_{10}	24-Hour	µg/m^3	50	(NEPC, 2021)
	Annual	µg/m^3	25	(NEPC, 2021)
Particles as $PM_{2.5}$	24-Hour	µg/m^3	20	(NEPC, 2021)
	Annual	µg/m^3	7	(NEPC, 2021)
TSP	24-Hour	µg/m^3	90	(DWER, 2019)
Deposited Dust[2]	Annual	g/m^2/month	2	(DWER, 2021)

Notes:

1. Reference temperature 0 °C
2. Maximum increase in deposited dust level

3 Air Dispersion Modelling and Meteorology

3.1 Model Utilised

MRP utilised the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) air dispersion model for the assessment. AERMOD is a United States Environmental Protection Agency (USEPA) recommended air dispersion model that is the preferred model for near-field regulatory applications (less than 50 km). AERMOD is commonly used for assessing impacts from industrial sites and is widely accepted by state and territory environment regulatory agencies within Australia.

The air dispersion modelling was conducted to predict deposition rates and ambient concentrations of TSP and ambient concentrations of PM_{10} and $PM_{2.5}$ across the modelled domain.

3.2 Meteorological Data

Processing of meteorological data for AERMOD for the dispersion modelling was completed using the AERMET meteorological pre-processor. Meteorological modelling was completed with consideration of the EPA Victoria guidance publication (1550) (EPA VIC, 2013). A site-specific meteorological file was developed for input to the model using representative meteorological monitoring data collected from the Perth Airport Bureau of Meteorology (BoM) monitoring station, augmented with data generated by The Air Pollution Model (TAPM) where required. TAPM was developed by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) and consists of coupled prognostic meteorological and air pollution dispersion model components.

3.3 Meteorology

Figure 3-1 shows the 2017 wind rose for Perth Airport BoM weather station. The average wind speed was 4.8 m/s and the maximum wind speed 14.5 m/s. Winds were predominantly from the southwest quadrant.

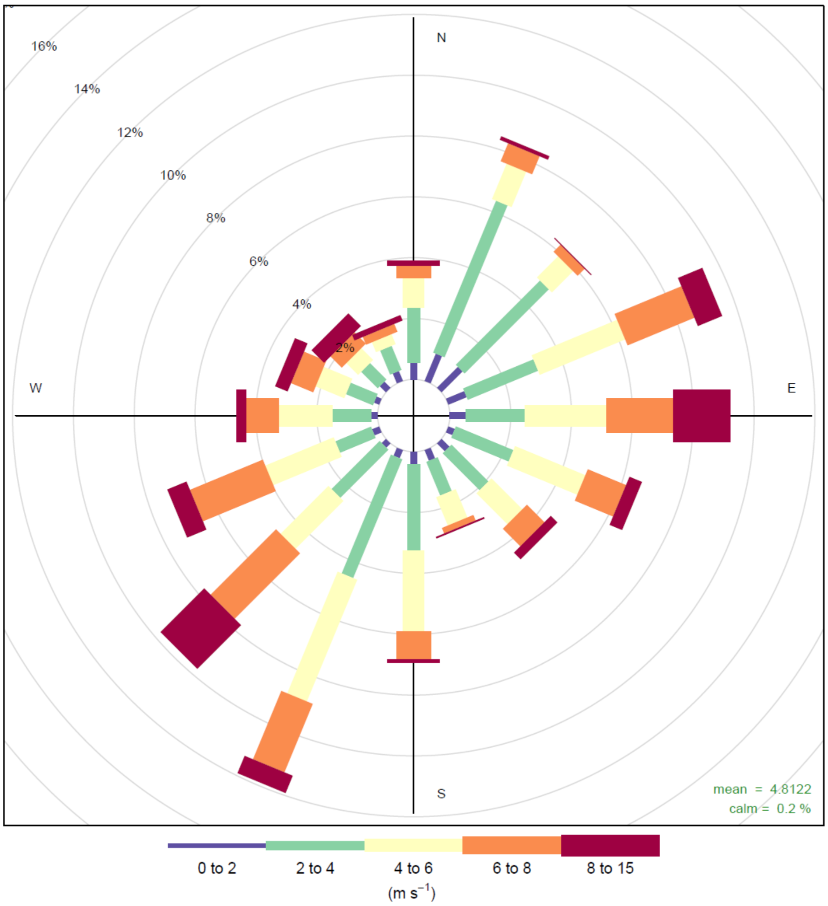

Figure 3-1: 2017 Perth Airport BoM Wind Rose

3.4 Existing Dust Levels

The Western Australian DWER collects air quality data from monitoring stations throughout Perth. Two sites that monitor the pollutants of interest, within 14 km from Welshpool, were identified:

- Caversham (North-east suburbs of Perth), the site at a semi-rural location
- South Lake (Southern suburbs of Perth), the site located at a residential area.

To determine a background concentration to assess potential cumulative impacts for the purposes of this study, particulate monitoring data from the two monitoring stations was utilised.

No specific guidance for selection of an appropriate background level is provided in Western Australia. However, in Victoria, the SEPP (AQM) (EPA VIC, 2001) states that the 70th percentile concentration (concentration which is exceeded by 30% of concentrations for that averaging period) should be adopted as the background level for short-term averaging periods.

The DWER reports annually the 75th percentile for PM_{10} and $PM_{2.5}$ 24-hour average concentrations. Hence, in absence of the 70th percentile, the 75th percentile PM_{10} and $PM_{2.5}$ 24-

hour concentration and annual average measured at the Caversham and South Lake monitoring stations for the 2019 monitoring were used to represent the ambient background concentration for the cumulative assessment, as a conservative scenario. The background concentrations of both sites are summarised in Table 3-1 (DWER, 2020).

Table 3-1: Background PM_{10} and $PM_{2.5}$ Concentrations

Pollutant	Averaging Period	Caversham ($\mu g/m^3$)[1]	South Lake ($\mu g/m^3$)[1]	Maximum Concentration ($\mu g/m^3$)[1]
PM_{10}	75th percentile 24-hour	23	22	23
	Annual	19	18	19
$PM_{2.5}$[2]	75th percentile 24-hour	7	7	7
	Annual	5.3	5.2	5.3

Notes:

1. Reference temperature 0 °C
2. Unadjusted concentration

It is important to recognise that all concentrations presented in Table 3-1 are from TEOM particle monitors Model 1400AB. Some of these concentrations have had adjustments made as recommended by the manufacturers in the TEOM operating manual.

This is done using the formula Y=A+Bx, where Y is the adjusted mass concentration, x is the unadjusted mass concentration, A (Const A) is the intercept factor and B (Const B) is the slope factor. The values of A and B must be set to their default values of 3.000 and 1.030, respectively, for the Series 1400a Monitor to be used as a US EPA equivalent method for PM_{10} measurements. These adjustment factors were determined at sites where non-volatile particulate matter-dominated and, therefore, the adjustment factors reflect the filter character more than they reflect the particulate matter.

For $PM_{2.5}$ measurements, it is justifiable to use the original constants (3.000 and 1.030), because the technical rationale may still apply. The DWER notes that the other option is to use no adjustment for $PM_{2.5}$, by setting the constants to values of 0.000 (Const A) and 1.000 (Const B) as is applied by other jurisdictions in Australia. A March 2003 AAQ NEPM technical paper on Monitoring for Particles as $PM_{2.5}$ using a TEOM advised the following: “When the monitor is operated as an equivalent PM_{10} monitor, the values of A and B are set to 3.0 and 1.03 respectively. For operation as a $PM_{2.5}$ monitor for the equivalency program the values for A and B must be set to 0 and 1.0 respectively” (DWER, 2020).

The background values for PM_{10} have used the adjusted values and the values for $PM_{2.5}$ presented in this assessment have utilised the unadjusted monitored values in accordance with the NEPM guideline.

4 Particulates Emission Estimates

4.1 Methodology

The particulates and dust emission were estimated using the "*National Pollutant Inventory Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing*" (NPI manual) (NPI, 1999).

Equation 4-1 from the NPI manual was employed to estimate the emissions of each identified source:

Equation 4-1: General Equation to Estimate Emissions

$$E_{kpy,i} = [A \times OpHrs]EF_i * \left[1 - \left(\frac{CE_i}{100}\right)\right] \quad (1)$$

Where:
$E_{kpy,i}$ =emission rate of pollutant i, kg/yr
A = activity rate, t/hr
OpHrs = operating hours, hr/yr
EF_i = uncontrolled emission factor of pollutant i, kg/t
CE_i = overall control efficiency of pollutant i, %

Table 4-1 and Table 4-2 outline the operational characteristics of each identified source and the dust reduction measures that will be in place for both the current and proposed operations of the plant. The facility is sealed and so wheel generated dust is not expected to be significant. The facility also contains truck washdown areas and is regularly swept, therefore wind-blown dust is not expected to be significant at the site.

4.2 Summary of Emission Estimates

Table 4-1 and Table 4-2 present the emission rates for PM_{10}, $PM_{2.5}$ and TSP for the current and proposed operations. The emission rates for $PM_{2.5}$ were estimated using a recommended 0.15 ratio of $PM_{2.5}/PM_{10}$ outlined in the "*Background Documents for revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors*" (Midwest Research Institute, 2006). While the TSP emission rates were calculated employing a TSP/PM_{10} ratio calculated from the USEPA concrete batching manual (USEPA, 2006). The emission factors and the percentage of control efficiency of the pollutants were taken from the NPI manual according to the dust reduction measures in place for each source and are based on the emission rates for PM_{10}. Peak production figures were used as a conservative measure to estimate the emission rates at the worst-case scenario.

Table 4-1: PM_{10} Emission Estimates, Emission Factors and Operational Characteristics of Particulate and Dust Sources for Current Operations

Process	Emission Rate (g/s)			Emission Rate for Material Handling (kg/h)	Activity (t/h)	Emission Factor for Material Handling (kg/t)	Peak loads per day (Load/day)	Peak tonnes loaded/unloaded per day (T/day)	Peak volume per hour (m³/h)	Emission Rate for Wind Erosion (kg/h)	Emission Factor for Wind erosion (kg/ha/h)	Exposed area (ha)	Operational Hours (h/day)	Control Efficiency (%)	Dust Control Measures
	PM_{10}	$PM_{2.5}$	TSP												
Cement Truck Unloading	-	-	-	-	-	-	20	592	100	0	0	0	-	100%	Fully Enclosed with Baghouse
Truck Mixer Loading	-	-	-	0.005	152	0.01	340	1,819	100	0	0	0	10	100%	Fully Enclosed with Baghouse
Aggregate Unloading	0.02	0.003	0.04	1.431	102	0.014	50	1,227	100	0	0	0	10	95%	Water Sprays & Enclosure (2 or 3 Walls)
(Bin) Silos	-	-	-	1.431	102	0.014	340	1,227	100	0	0	0	10	100%	Fully Enclosed with Baghouse
Aggregate Weigh Hoppers	0.028	0.0043	0.057	1.022	102	0.01	340	1,227	100	0	0	0	10	90%	Enclosure (2 or 3 Walls)
Wind Erosion of Open Stockpiles	0.00045	0.000068	0.0009	-	-	-	-	-	-	0.002	0.1625	0.01	24	95%	Water Sprays & Enclosure (2 or 3 Walls)

Table 4-2: PM_{10} Emission Estimates, Emission Factors and Operational Characteristics of Particulate and Dust Sources for Proposed Operations

Process	Emission Rate (g/s)			Emission Rate for Material Handling (kg/h)	Activity (t/h)	Emission Factor for Material Handling (kg/t)	Peak loads per day (Load/day)	Peak tonnes loaded/unloaded per day (T/day)	Peak volume per hour (m³/h)	Operational Hours (h/day)	Control Efficiency (%)	Dust Control Measures
	PM_{10}	$PM_{2.5}$	TSP									
Cement Truck Unloading	-	-	-	-	-	0	48	592	300	-	100%	Fully Enclosed with Baghouse
Truck Mixer Loading	-	-	-	0.0048	178	0.01	816	4,272	300	24	100%	Fully Enclosed with Baghouse
Aggregate Unloading	0.03	0.0045	0.06	2.1467	153	0.014	120	3,680	300	24	95%	Water Sprays & Enclosure (2 or 3 Walls)
(Bin) Silos	-	-	-	2.1467	153	0.014	816	3,680	300	24	100%	Fully Enclosed with Baghouse
Aggregate Weigh Hoppers	0.021	0.003	0.04	1.5333	153	0.01	816	3,680	300	24	95%	Enclosure (2 or 3 Walls)

5 Results

5.1 Ambient Air Quality

Maximum predicted 24-hour average and annual average ground level concentrations (GLCs) of TSP, PM_{10} and $PM_{2.5}$ were predicted across the modelling domain and at the sensitive receptor location nearest to the operations (residential area) for the current and proposed operations. The predicted maximum GLCs in isolation and cumulatively with the assumed background at the boundary of the facility near the residences are presented in Table 5-1 and Table 5-2.

It is predicted that the pollutant concentrations and dust deposition levels from the Welshpool plant will remain well below the relevant standard criteria. For the predicted concentrations, the highest predicted percentage of the guideline was 10% of the PM_{10} 24-hour average for the current operations and 12% for the proposed operations, with a maximum predicted concentration at the boundary of the residential area of 5.05 µg/m^3 and 5.93 µg/m^3 for the current and proposed operations respectively. The maximum total deposited dust level was predicted to be 0.34 g/m^2/month for current operations, and 0.28 g/m^2/month for the proposed operations at the nearest residential location, which was 17% and 14% of the guideline respectively. Figure 5-2 to Figure 5-12 depict the GLCs and the dust deposition as contour plots in isolation. Figure 5-13 to Figure 5-20 depict the cumulative GLCs and background concentrations as contour plots.

Table 5-1: Maximum Predicted Concentrations and Deposition at the Boundary of the Residential Area for Current Operations

Pollutant	Averaging Period	Units	Guideline Concentration (µg/m³)	Background (µg/m³)[1]	Predicted Concentration in Isolation (µg/m³)	% of Guideline	Cumulative Predicted Concentration (µg/m³)	% of Guideline
PM_{10}	24-hr	µg/m³	50	23	5.05	10%	28.05	56%
	Annual	µg/m³	25	19	0.61	2%	19.61	78%
$PM_{2.5}$	24-hr	µg/m³	20	6.9	0.81	4%	7.71	39%
	Annual	µg/m³	7	5.3	0.11	2%	5.41	77%
TSP	24-hr	µg/m³	90	-	8.90	10%	8.90	10%
Dust deposition	Annual	g/m²/month	2	-	0.34	17%	0.34	17%

Notes:

1. Maximum concentration between Caversham and South Lake, 75th percentile of the 24-hr average and 100th percentile of the annual average were taken
2. Considerations at a 0 °C reference temperature

Table 5-2: Maximum Predicted Concentrations and Deposition at the Boundary of the Residential Area for Proposed Facility

Pollutant	Averaging Period	Units	Guideline Concentration (µg/m³)	Background (µg/m³)[1]	Predicted Concentration in Isolation (µg/m³)	% of Guideline	Cumulative Predicted Concentration (µg/m³)	% of Guideline
PM_{10}	24-hr	µg/m³	50	23	5.93	12%	28.93	58%
	Annual	µg/m³	25	19	1.08	4%	20.08	80%
$PM_{2.5}$	24-hr	µg/m³	20	6.9	0.91	5%	7.81	39%
	Annual	µg/m³	7	5.3	0.17	2%	5.47	78%
TSP	24-hr	µg/m³	90	-	9.59	11%	9.59	11%
Dust deposition	Annual	g/m²/month	2	-	0.28	14%	0.28	14%

Notes:

1. Maximum concentration between Caversham and South Lake, 75th percentile of the 24-hr average and 100th percentile of the annual average were taken
2. Considerations at a 0 °C reference temperature

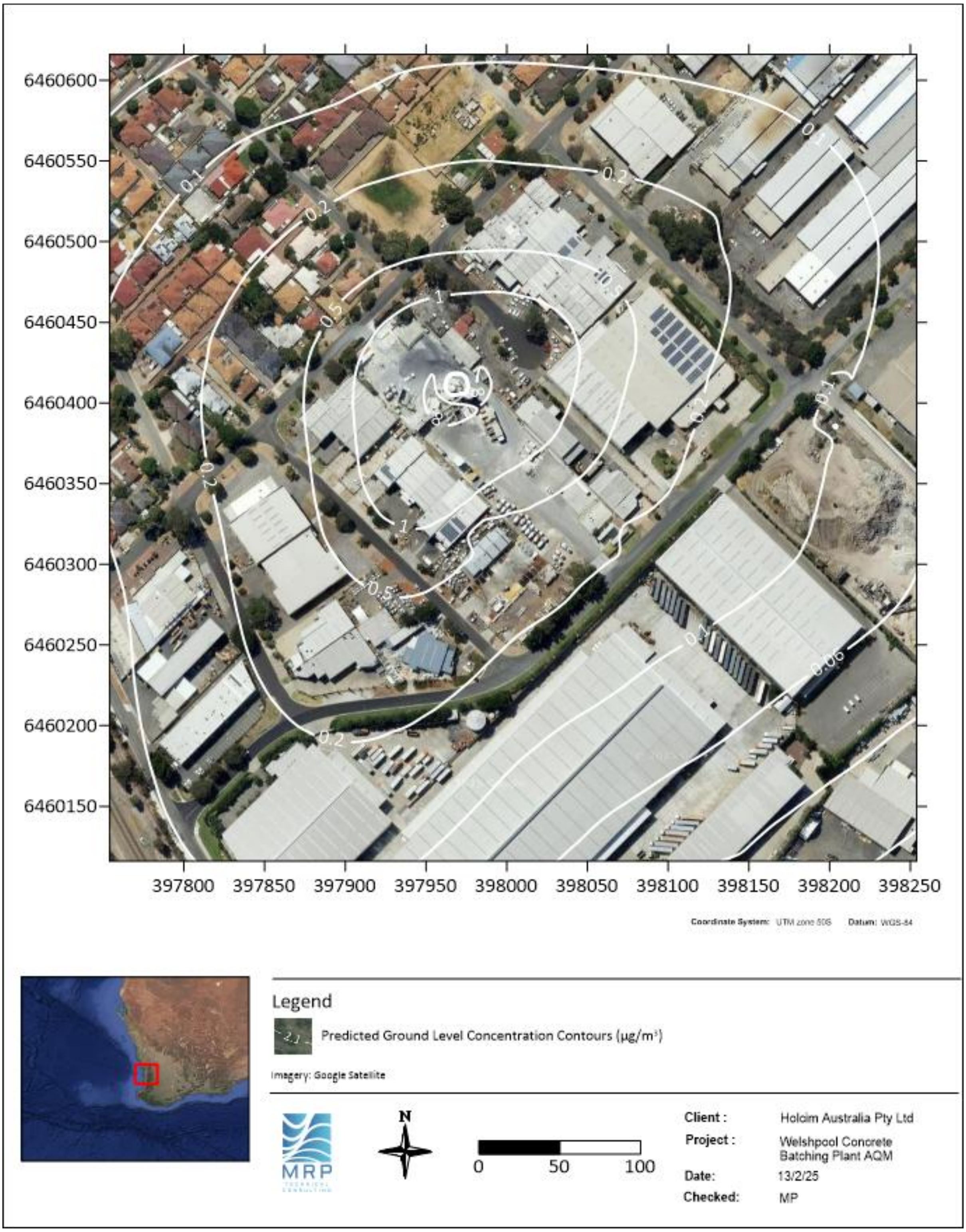

Figure 5-1: Predicted PM_{10} Annual Concentrations (μg/m³) in Isolation – Current

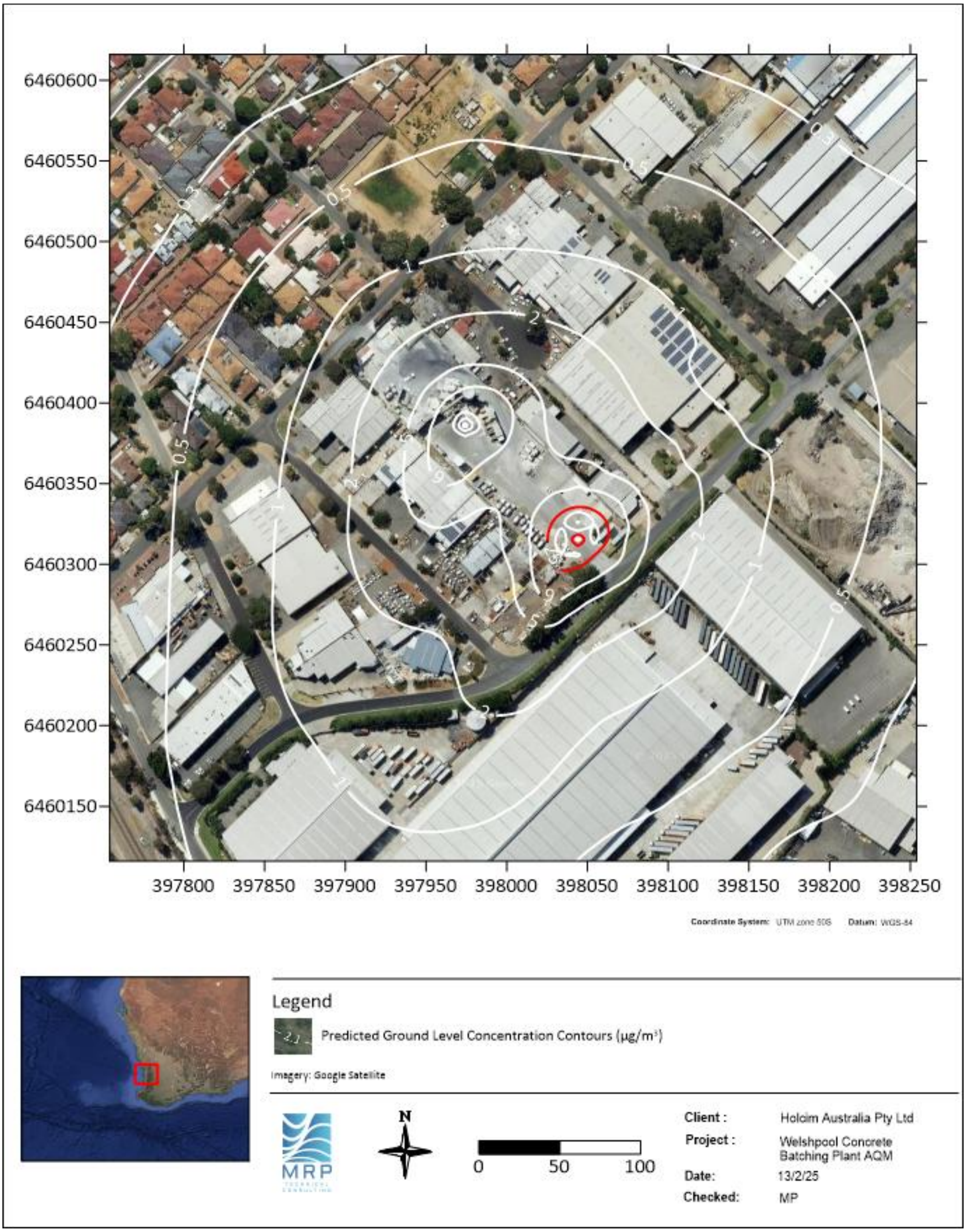

Figure 5-2: Predicted PM_{10} Annual Concentrations (μg/m^3) in Isolation – Proposed

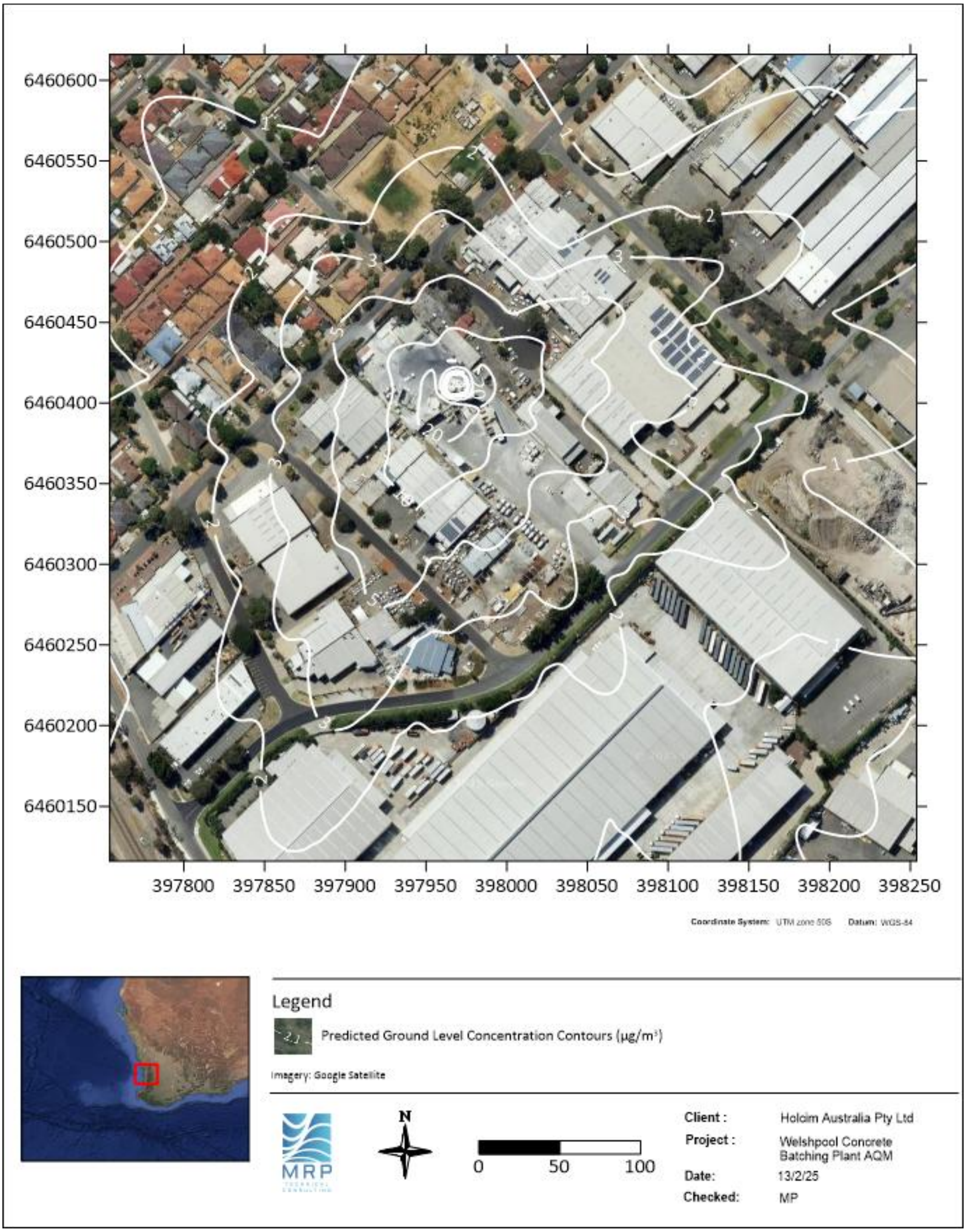

Figure 5-3: Predicted Maximum PM_{10} 24-hr Average Concentrations (µg/m³) in Isolation – Current

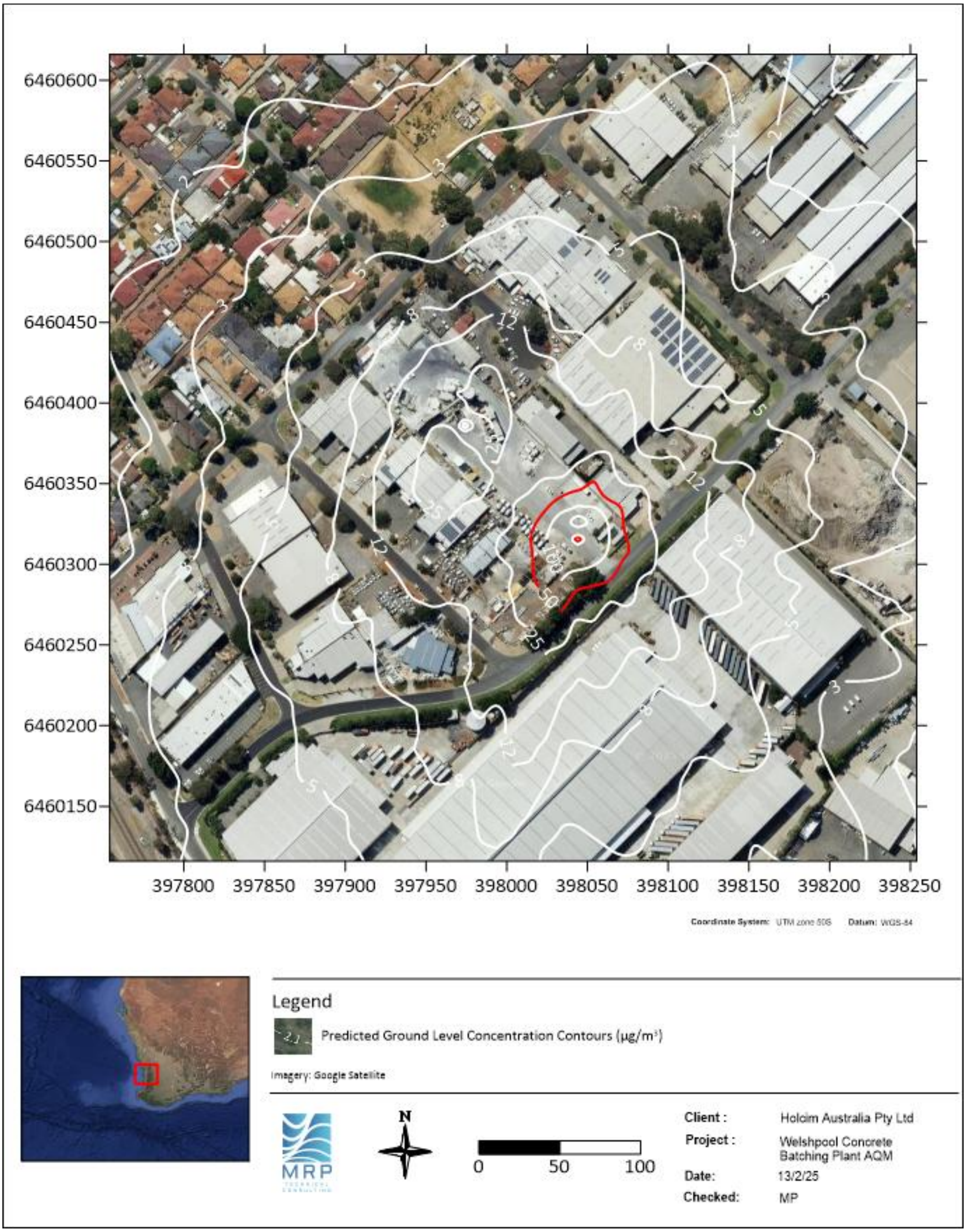

Figure 5-4: Predicted Maximum PM_{10} 24-hr Average Concentrations (µg/m³) in Isolation – Proposed

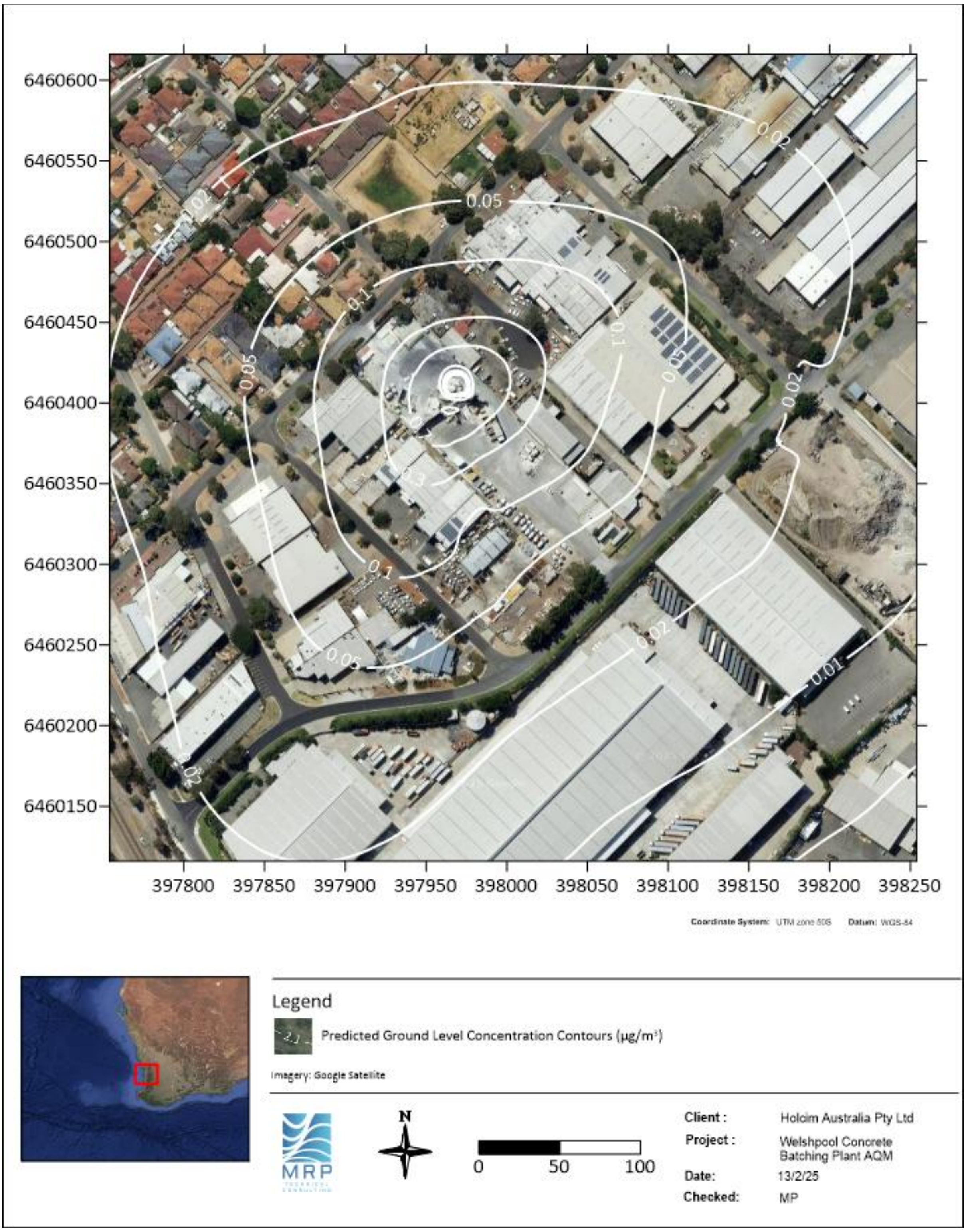

Figure 5-5: Predicted $PM_{2.5}$ Annual Concentrations (µg/m³) in Isolation – Current

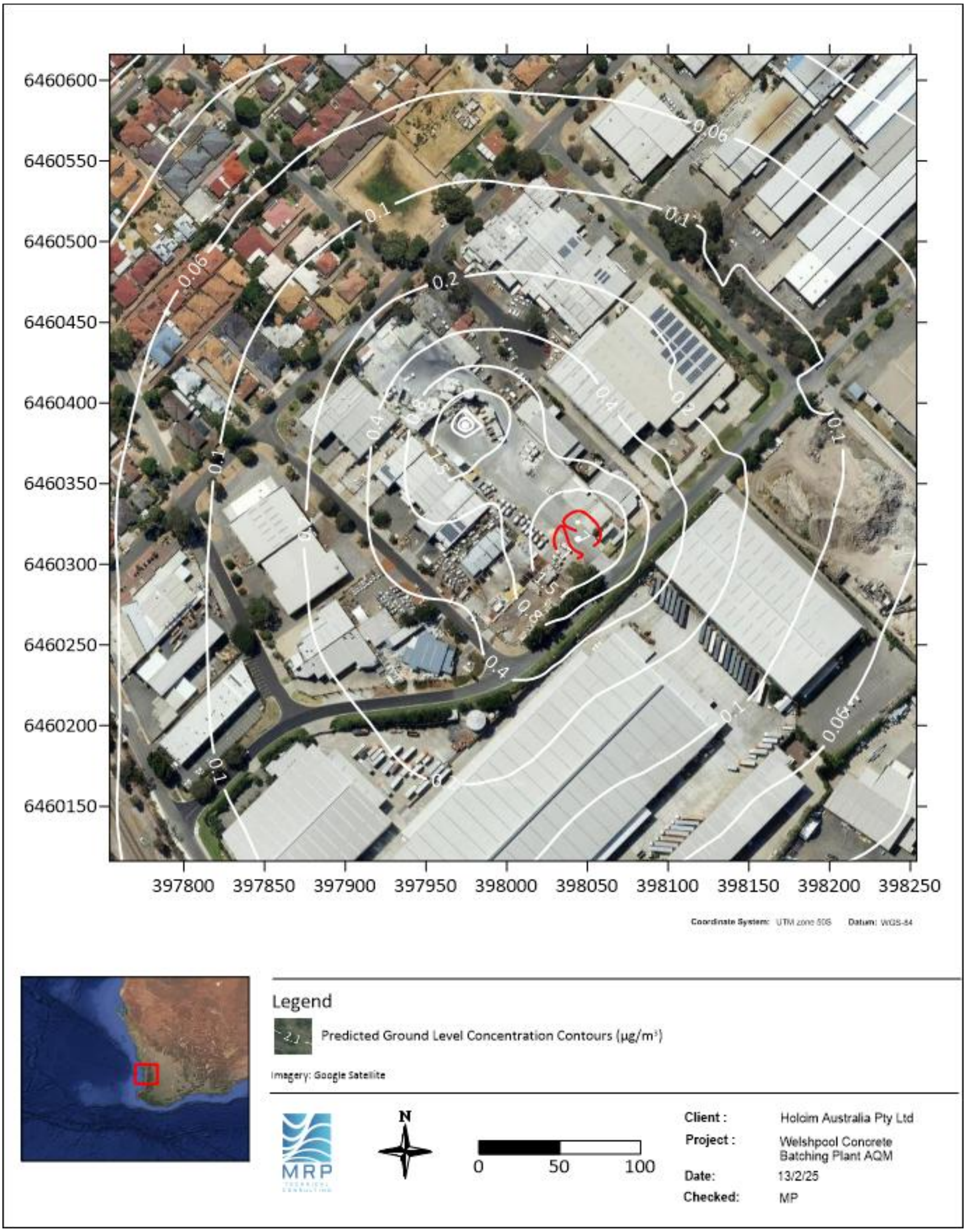

Figure 5-6: Predicted $PM_{2.5}$ Annual Concentrations (µg/m³) in Isolation – Proposed

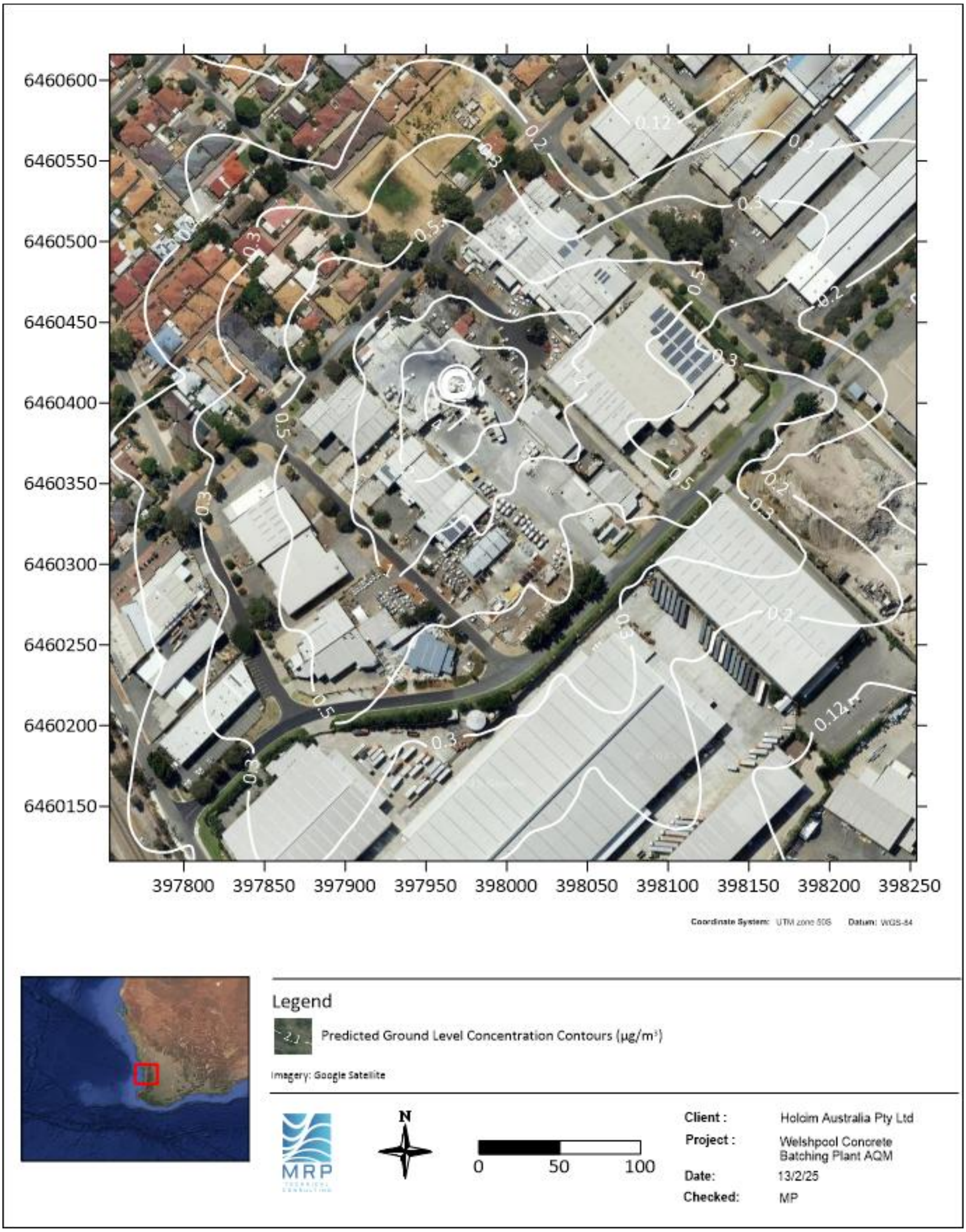

Figure 5-7: Predicted Maximum $PM_{2.5}$ 24-hr Average Concentrations (µg/m³) in Isolation – Current

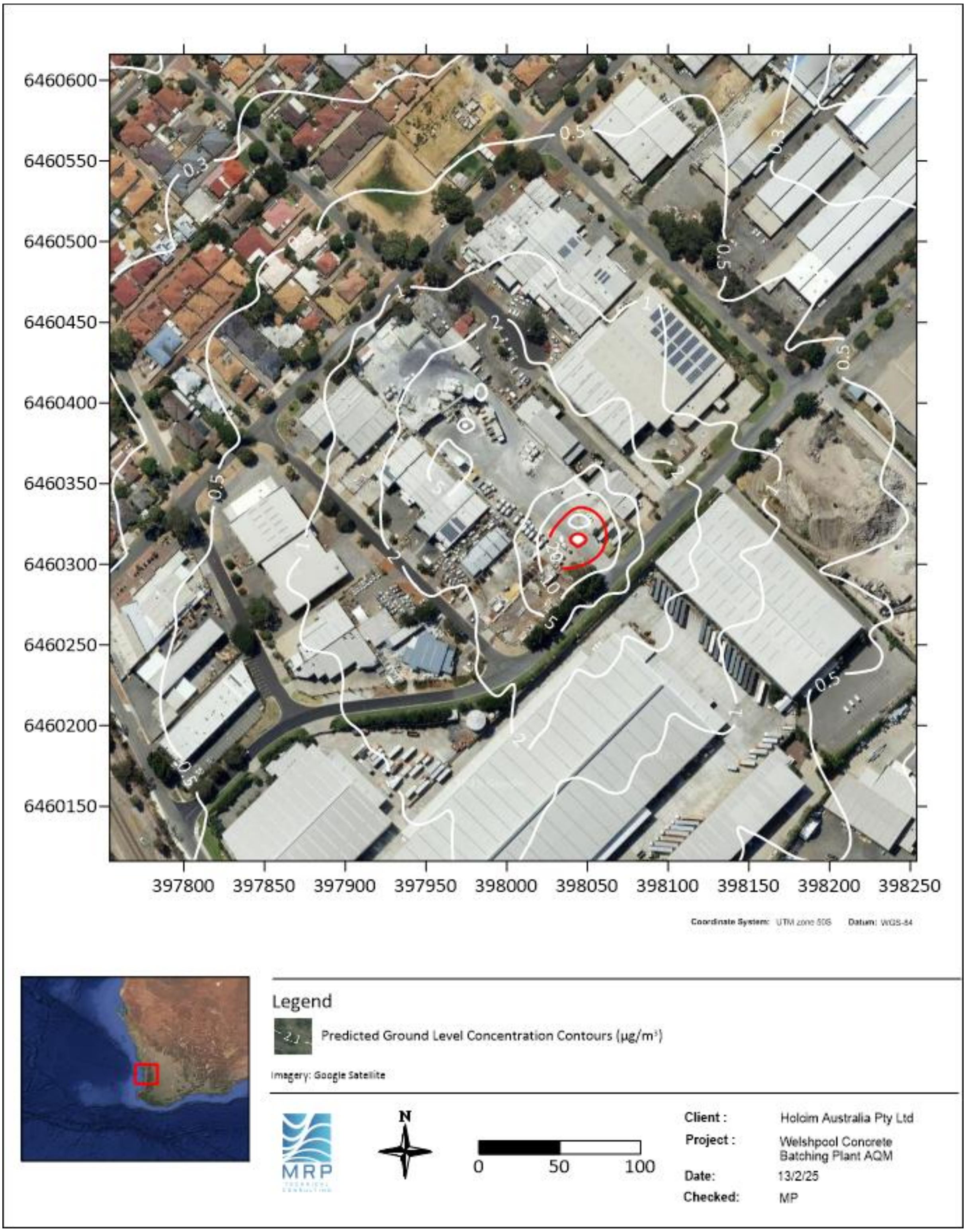

Figure 5-8: Predicted Maximum $PM_{2.5}$ 24-hr Average Concentrations (µg/m³) in Isolation – Proposed

Figure 5-9: Predicted Maximum TSP 24-hr Average Concentrations (µg/m³) in Isolation – Current

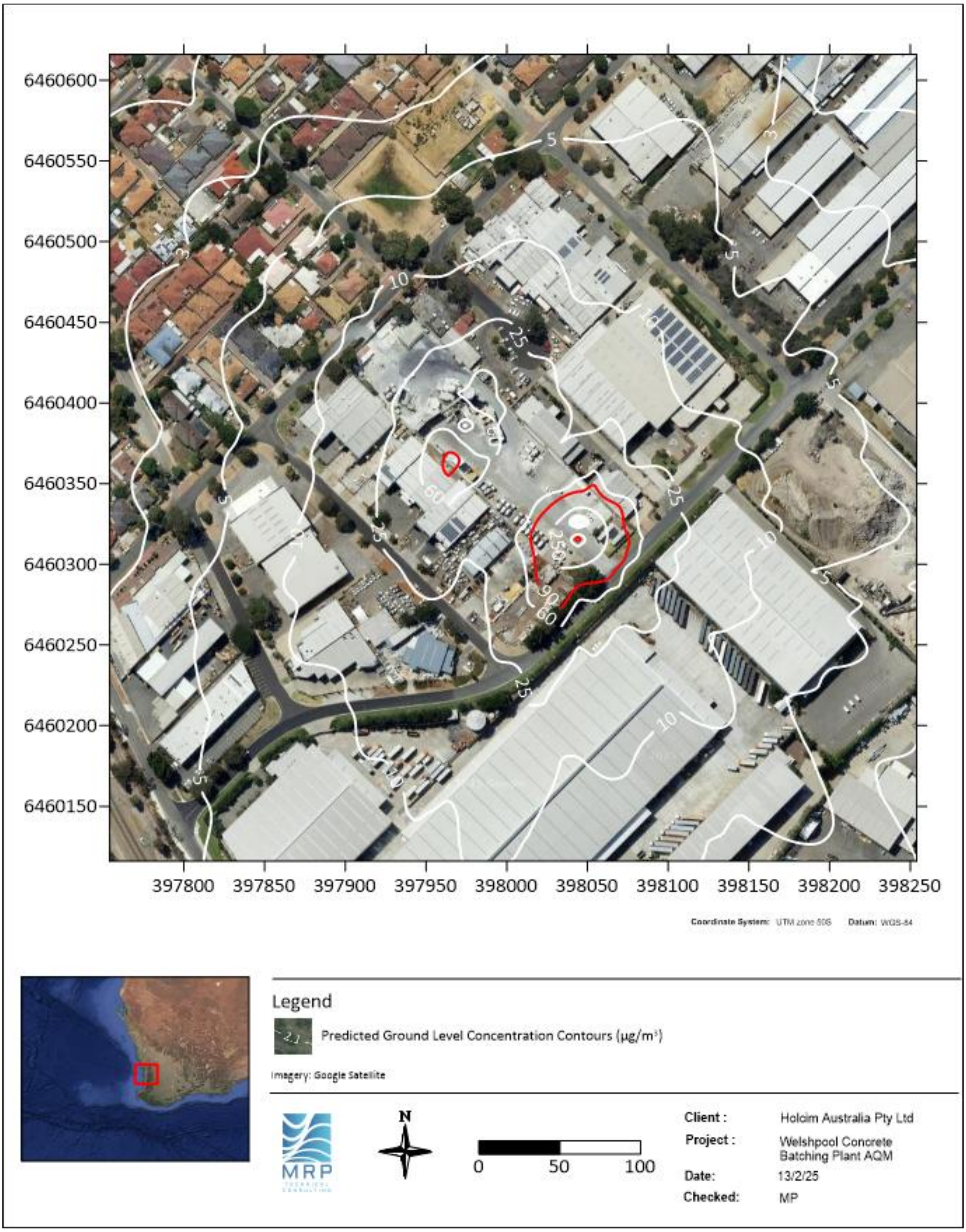

Figure 5-10: Predicted Maximum TSP 24-hr Average Concentrations (µg/m³) in Isolation – Proposed

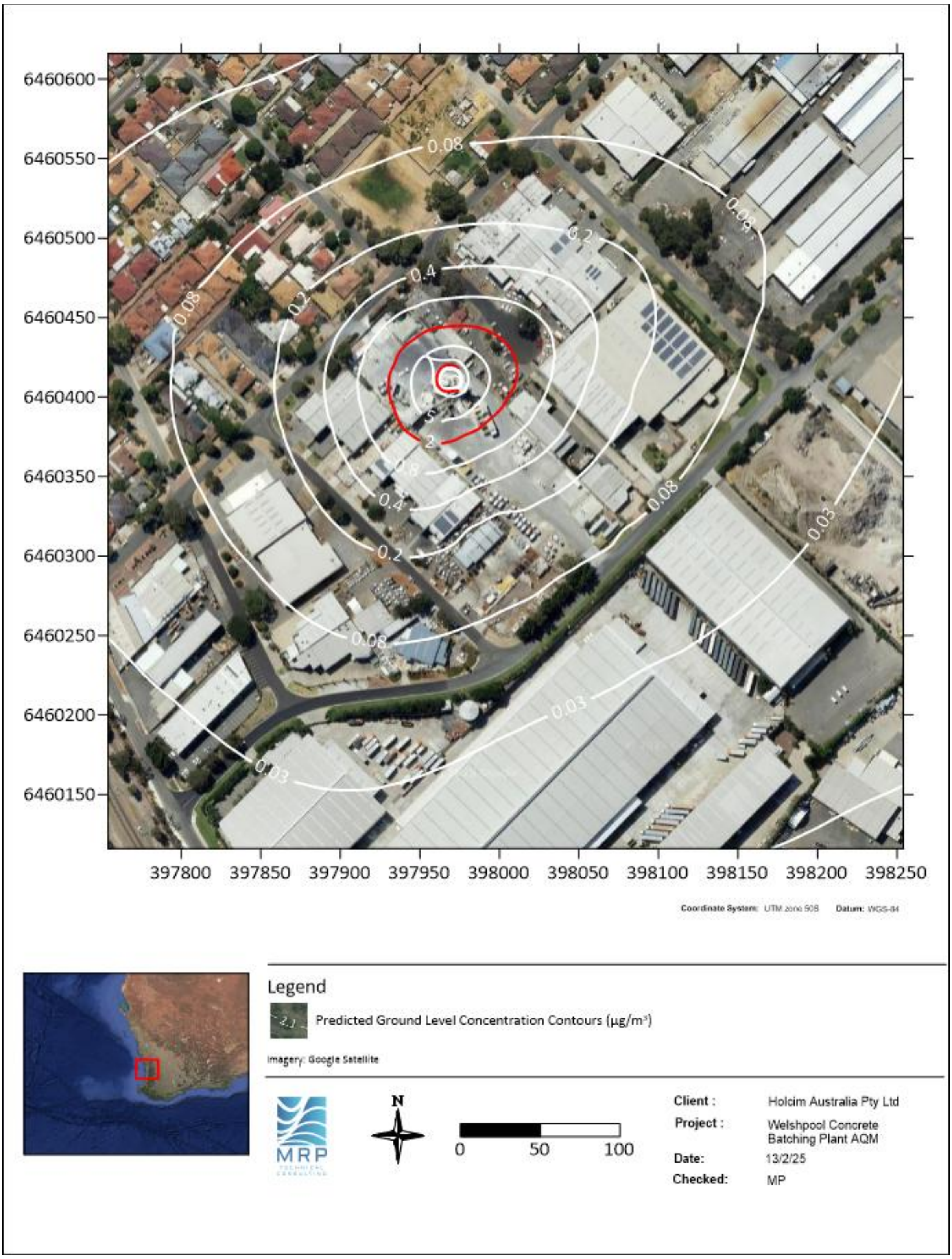

Figure 5-11: Predicted Maximum Monthly Dust Deposition (g/m²) in Isolation – Current

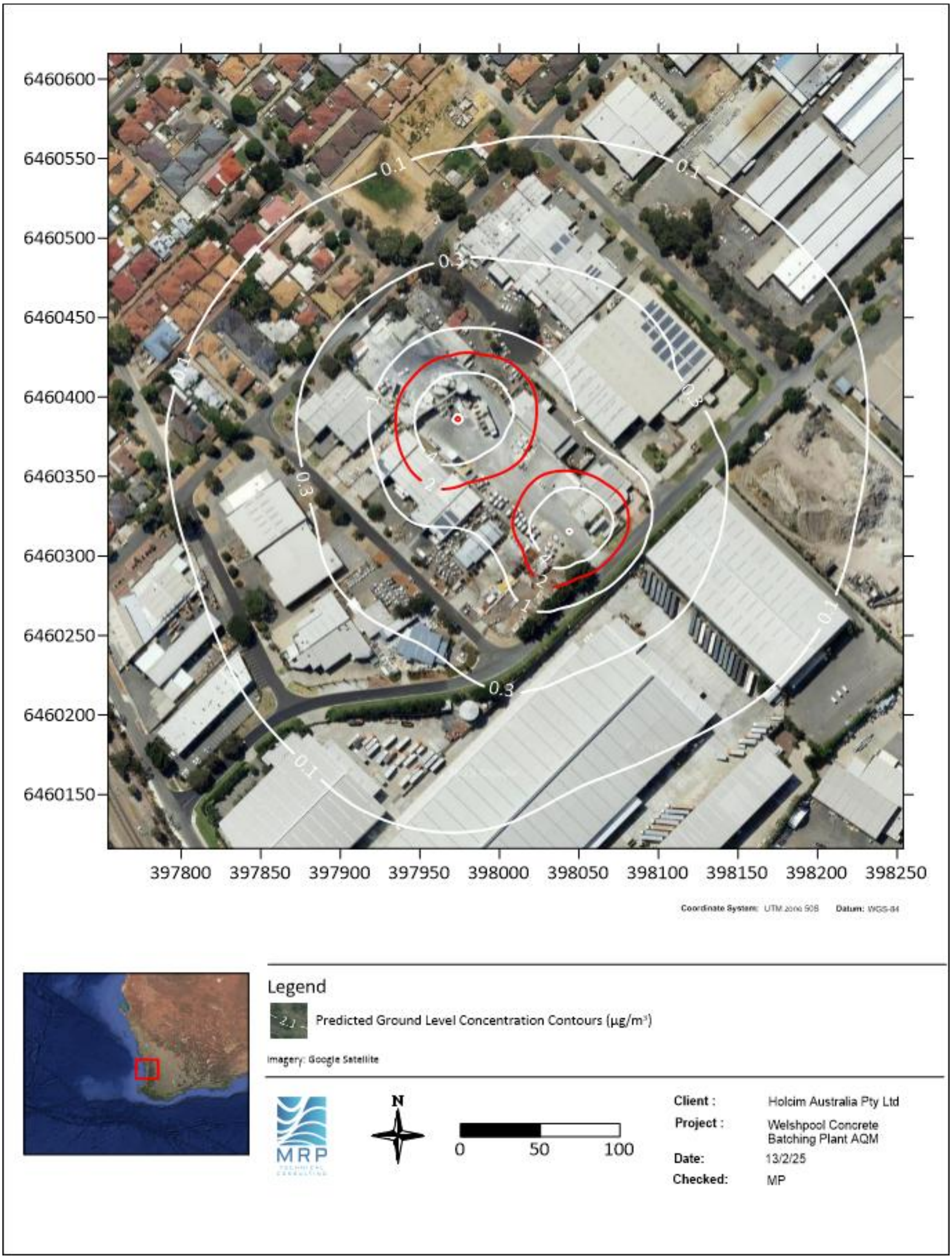

Figure 5-12: Predicted Maximum Monthly Dust Deposition (g/m²) in Isolation – Proposed

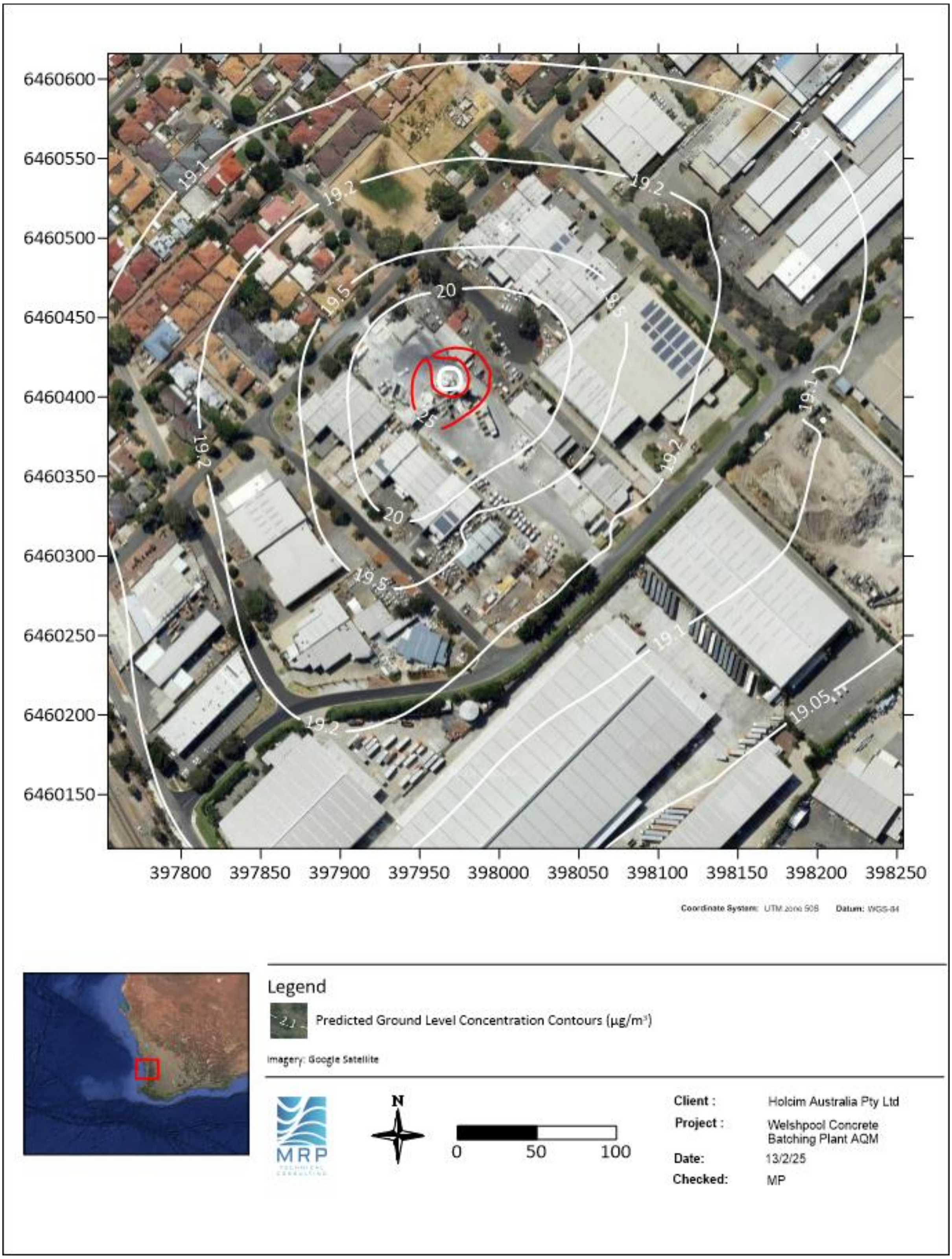

Figure 5-13: Predicted Cumulative PM_{10} Annual Concentrations (µg/m³) – Current

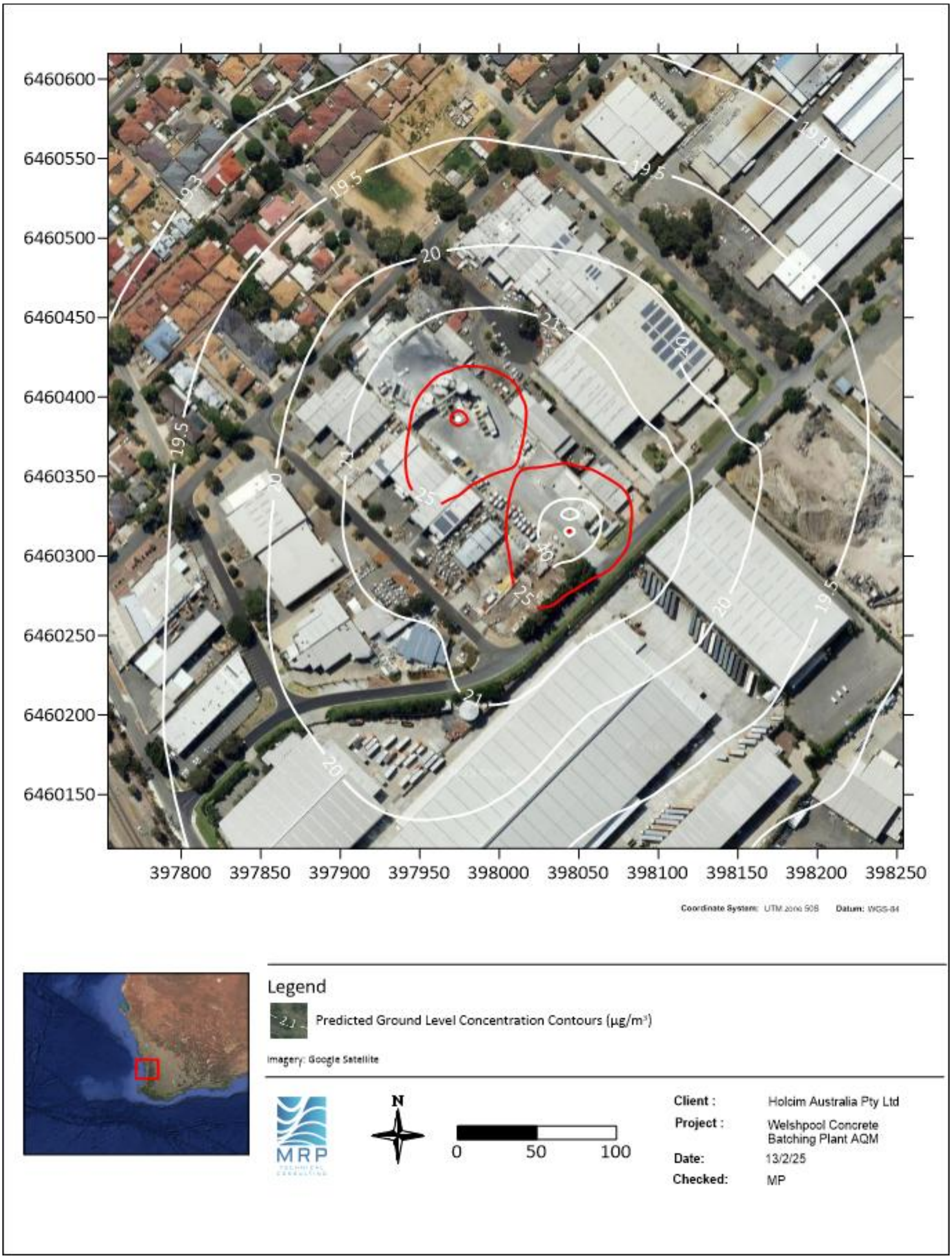

Figure 5-14: Predicted Cumulative PM_{10} Annual Concentrations (µg/m³) – Proposed

Figure 5-15: Predicted Cumulative Maximum PM_{10} 24-hr Average Concentrations (µg/m³) – Current

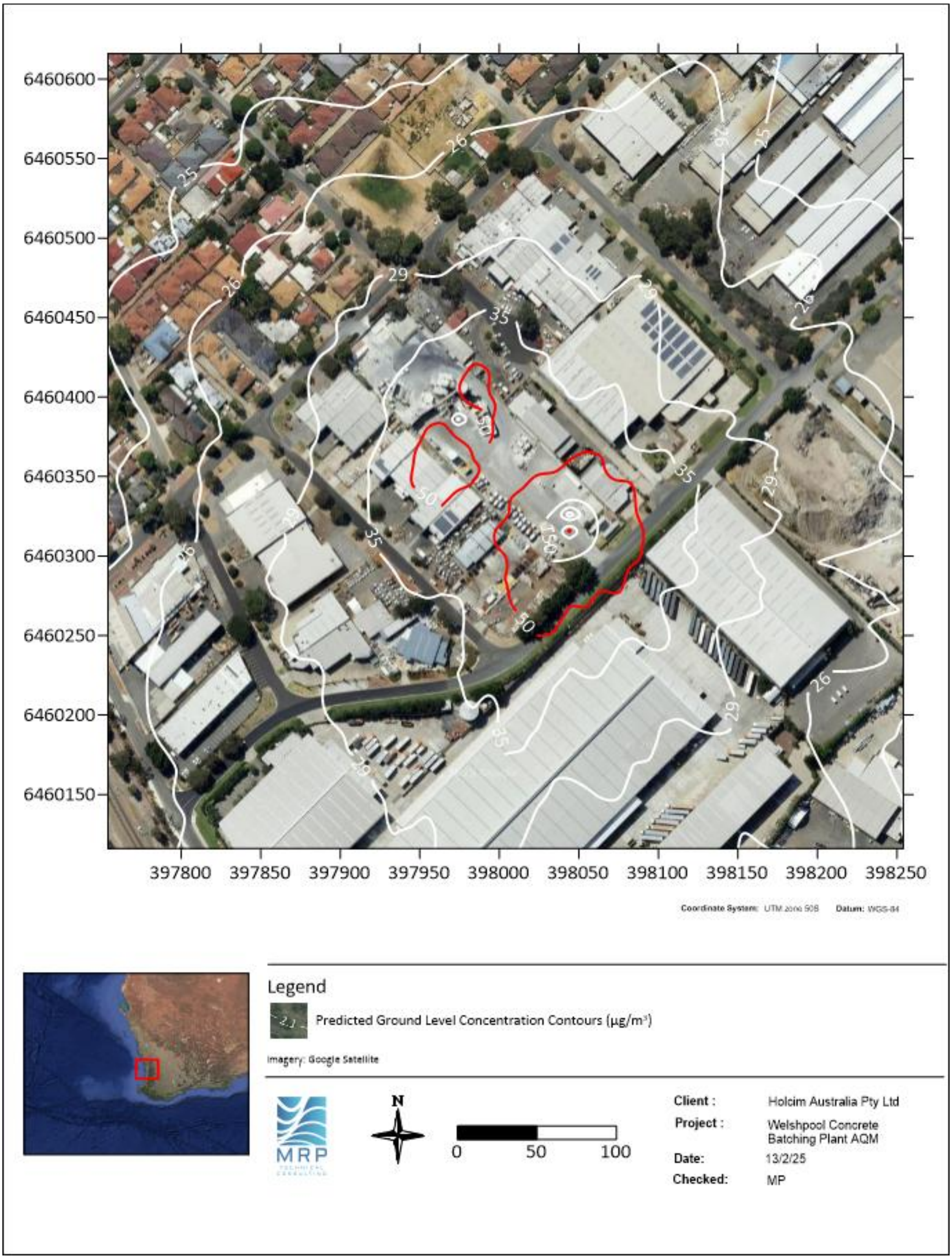

Figure 5-16: Predicted Cumulative Maximum PM_{10} 24-hr Average Concentrations (µg/m³) – Proposed

Figure 5-17: Predicted Cumulative $PM_{2.5}$ Annual Concentrations (µg/m³) – Current

Figure 5-18: Predicted Cumulative $PM_{2.5}$ Annual Concentrations (µg/m³) – Proposed

Figure 5-19: Predicted Cumulative Maximum $PM_{2.5}$ 24-hr Average Concentrations (µg/m³) – Current

Figure 5-20: Predicted Cumulative Maximum $PM_{2.5}$ 24-hr Average Concentrations (µg/m³) – Proposed

5.2 Air Quality Management

Concrete batching is a process that can generate dust emissions, however implementation of appropriate controls can significantly reduce emissions from a facility. The air dispersion modelling conducted predicted ground level concentrations for dust associated with the redevelopment of the Welshpool concrete plant to be below all of the relevant standards at sensitive receptor locations. Predictions from the air dispersion modelling indicate that predicted concentrations at the nearest receptor for the proposed operations are comparable with those predicted for current operations indicating little potential change from current operations.

As ambient dust concentrations from the current and proposed facility have been predicted to be below the relevant criteria, it is likely that the upgrade to the facility represents a low risk to health and amenity at nearby sensitive receptor locations.

MRP recommends that Holcim continue to manage their dust emissions sources and activities through the implementation of the air quality management plan (AQMP) as attached in Appendix 1. The AQMP includes the following:

- Management of the dust generated activities and sources, conducting visual inspections of the site and maintenance of the equipment when appropriate;
- Establishes a pathway and an action plan to receive and verify complaints;
- Outlines monitoring to be conducted at the site; and
- Describes actions to be undertaken when the dust is detected either by complaints or by inspections.

6 Conclusions

MRP has undertaken an air quality assessment for the redevelopment of the Welshpool concrete batching plant. The emission rates of the redevelopment were estimated using the NPI manual for *Emission Estimation Technique Manual for Concrete Batching and Concrete Product Manufacturing* and AERMOD was used to predict the TSP, PM_{10}, $PM_{2.5}$ concentrations and the dust deposition. Background level concentrations from Caversham and South Lake were used to assess cumulative impacts.

The TSP, PM_{10}, $PM_{2.5}$ concentrations in isolation and cumulatively as well as dust deposition concentrations are predicted to remain well below the standard criteria at sensitive receptor locations.

Comparative assessment shows that despite an increase in production, due to the implemented controls and relocation of some sources away from sensitive receptors, concentrations of TSP, PM_{10} and $PM_{2.5}$ are unlikely to differ from current operations at nearby sensitive receptors. Given the small number of verified complaints that have been received and incidents that have occurred have related to upset conditions rather than normal operations, and that these problems have been quickly identified and rectified, it is unlikely that amenity will be significantly affected due to nuisance impacts from dust.

7 References

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Appendix 1 – Air Quality Management Plan

On behalf of
Holcim Australia Pty Ltd

Document type
Final Report

Date
29th May 2025

Holcim Australia Pty Ltd

Welshpool Concrete Batching Plant

Air Quality Management Plan

Project Name	**Welshpool Concrete Batching Plant Air Quality Modelling**
Project No.	**01-0043**
Document Type	**Draft Rev A**
Date	**29th May 2025**
Prepared By	**Caelan Whiting**
Approved By	**Martin Parsons**

Revision	Date	Made by	Approved by	Description
A	29th May 2025	Caelan Whiting	Martin Parsons	Final

MRP Technical Consulting Pty Ltd prepared this report in accordance with the scope of work as outlined in our proposal to Holcim Australia Pty Ltd dated 21 January 2025 and in accordance with our understanding and interpretation of current regulatory standards.

The conclusions presented in this report represent MRP's professional judgement based on information made available during the course of this assignment and are true and correct to the best of MRP's knowledge as at the date of the assessment.

MRP did not independently verify all of the written or oral information provided during the course of this investigation. While MRP has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to MRP was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

This report has been prepared for Holcim Australia Pty Ltd and may not be relied upon by any other person or entity without MRP's express written permission.

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1 Introduction

1.1 Background

Holcim Australia Pty Ltd (Holcim) operates the Welshpool concrete plant located at 12 Cohn Street in Carlisle, 7.5 km from Perth business district centre. The batching plant currently produces up to 110,000 m^3 of concrete products annually. Holcim is proposing to redevelop the Welshpool plant to increase its annual production of concrete products to 300,000 m^3. MRP Technical Consulting Pty Ltd (MRP) were engaged by Holcim to develop an air quality management plan (AQMP) on behalf of Holcim for its operations at the Welshpool Batching Plant.

1.2 Operational overview

The concrete production process consists of mixing aggregate (sand, gravel, crushed stone or slag) and slurry (cement plus water) to obtain concrete. The Welshpool concrete plant will receive aggregate from tippers that will unload the aggregate into underground level bins. Cement will be unloaded by tankers through a closed system and stored in elevated silos. The aggregate will pass through weighers and will be transported by conveyor to fully enclosed holding hoppers to be mixed with water and cement into the agitators.

The plant redevelopment of the concrete batching plant will be nominally comprised of:

- Enclosed aggregate bins;
- Enclosed cement silos;
- Underground aggregate hopper;
- Enclosed aggregate silo bins;
- Aggregate weighers; and
- Cement weighers.

1.3 Sources of dust

Potential sources of particulates from the site have been identified as the following:

- Delivery of aggregate and cement material to site by truck;
- Transfer and handling of aggregate at storage bins, handling facility and within the facility;
- Transferring cement and cement supplement into silos from delivery trucks;
- Conveying and loading of materials to agitator trucks;
- Wheel-generated dust from trucks movements across paved surfaces; and
- Wind erosion from material storage bins and adjacent paved surfaces.

1.4 Nearest receptors

The closest sensitive receptor is located within 10m to the north-west of the plant boundary (Figure 1-1).

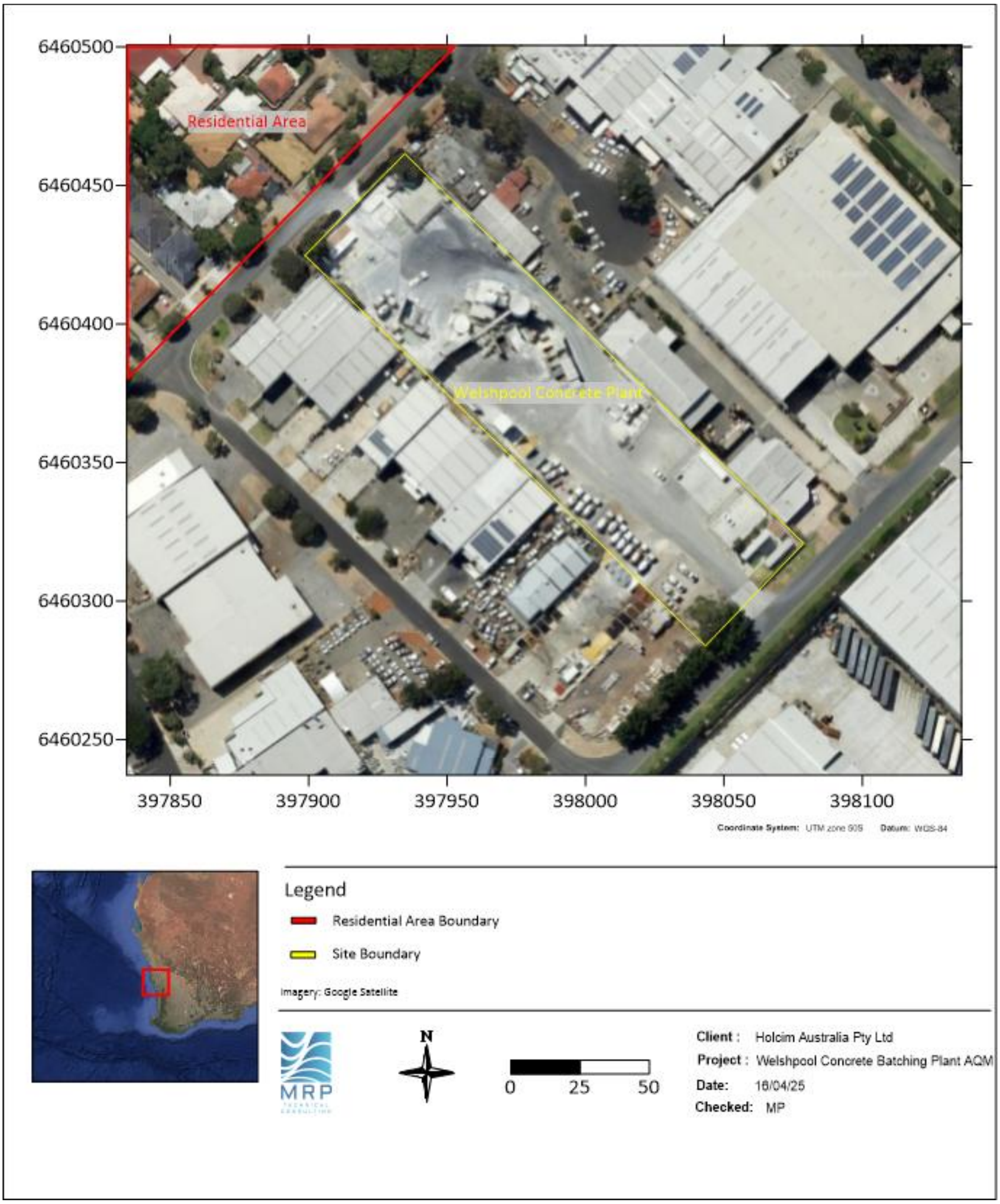

Figure 1-1: Welshpool concrete site location

2 Air quality criteria

Particulate matter (PM) is generally defined as particles that can remain suspended in the air by turbulence for an appreciable length of time. PM can consist of a range of matter including crustal material, pollens, sea salts and smoke from combustion products. PM is commonly defined by the size of the particles including the following:

- Total suspended particulates (TSP), which is all particulate matter with an equivalent aerodynamic particle diameter below 50 µm diameter;
- PM_{10} is particulate matter below 10 µm in equivalent aerodynamic diameter; and
- $PM_{2.5}$ is particulate matter below 2.5 µm in equivalent aerodynamic diameter.

TSP contains PM_{10} and $PM_{2.5}$ fractions and is normally associated with amenity and nuisance impacts. PM_{10} and $PM_{2.5}$ are generally associated with the potential for health impacts as particles this size and below may enter the lungs. This study has focussed on predicted PM_{10} and $PM_{2.5}$ ambient air quality concentrations and TSP deposition.

Table 2-1 contains the relevant criteria for particulate matter. The standards are based on the following guidelines:

- National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) by the National Environment Protection Council (NEPC, 2021) noting that a proposed variation to the $PM_{2.5}$ standards has recently come into effect as of January 2025;
- Guideline – Dust Emissions - Draft for external consultation by the Department of Water and Environmental Regulation (DWER, 2021).
- Guideline – Air emissions – Draft for external consultation by the Department of Water and Environmental Regulation (DWER, 2019).

Table 2-1: Relevant air quality standards

Pollutant	Averaging Period	Unit[1]	Ambient Air Concentration Standard	Reference
Particles as PM_{10}	24-Hour	µg/m³	50	(NEPC, 2021)
	Annual	µg/m³	25	(NEPC, 2021)
Particles as $PM_{2.5}$	24-Hour	µg/m³	20	(NEPC, 2021)
	Annual	µg/m³	7	(NEPC, 2021)
TSP	24-Hour	µg/m³	90	(DWER, 2019)
Deposited Dust[2]	Annual	g/m²/month	2	(DWER, 2021)

Notes:

1. Reference temperature 0 °C
2. Maximum increase in deposited dust level

3 Air quality management

3.1 Introduction

This AQMP includes a series of actions that will be undertaken by Holcim to manage dust generated through its activities and sources. It establishes a pathway and an action plan to receive and verify complaints, describes actions to be undertaken when the dust is detected either by complaints or by inspections and outlines monitoring and reporting to be undertaken by Holcim to demonstrate the effectiveness of its management of dust from its facility.

This AQMP is to be implemented with the following assignment of responsibility.

Task	Responsibility	Timing
AQMP Implementation	Site Manager	Ongoing
Monitoring dust (visual and reaction to alarms)	Site Manager	Ongoing
Ensure loads are covered as trucks arrive and leave the site	Site Manager	Ongoing
Inducting staff on the requirements within the AQMP	Site Manager	As required
Recording and responding to complaints	Site Manager	As required

Table 3-1: Dust management responsibilities

3.2 Control and mitigation measures

Concrete batching is a process that can generate dust emissions, however implementation of appropriate controls can significantly reduce emissions from a facility. The Welshpool concrete plant redevelopment has been designed to have the following dust control and mitigation measures:

- All areas will be paved and swept regularly including the prompt cleaning of any spilled materials;
- Covered conveyors and transfer points to move aggregate to holding hoppers;
- Fully enclosed holding hoppers;
- Enclosed cement loading bay with dust extraction;
- Use of an enclosed pneumatic transfer system for cement unloading into silos with dust extraction;
- Automatic silo fill system that stops if silo becomes full;
- Enclosed aggregate bins;
- Conducting visual inspections of the site;
- Maintenance of the equipment when appropriate;
- Wash out pits for the agitators; and
- Enclosed loading bay with dust extraction system.

3.3 Monitoring

Holcim will undertake a dust monitoring programme comprising monitoring for a week during each quarter of the year using an appropriate real time monitor for a 12-month period to verify the predicted dust concentrations arising from the development. The results of the monitoring will be provided to the Town of Victoria Park for review after the monitoring has been undertaken each quarter by a date agreed to by the Town of Victoria Park and Holcim.

Holcim will also undertake ad-hoc dust monitoring for a week following a complaint where an investigation is undertaken and the point source of the dust has not been identified.

As much as practicable taking the constraints of site into consideration, the monitoring units will be installed in accordance with the following criteria specified in Australian Standard

AS/NZS 3580.1.1:2016 Methods for Sampling and Analysis of Ambient Air: Part 1.1 Guide to Siting Air Monitoring Equipment:

- A clear sky angle of 120°;
- Unrestricted airflow of 360° around the sample inlet;
- >10 m from nearest object or tree dripline;
- >5 m from nearest road; and
- No boiler or incinerator flues nearby.

At the time of reporting, the specific make and model for the PM_{10} monitoring is still to be selected. The constraints of the site with regards to mains power availability, existing and future land uses and access permissions, represent key factors for consideration in the selection of monitoring methods.

3.4 Complaints handling

Any complaint received by Holcim regarding dust impacts from the site will be acted on within 24-hours in the following manner:

- Details of the complaint (e.g. date, time, specifics and complainants contact details) will be noted;
- Activities occurring during the complaint period to be investigated. Coincident dust monitoring and meteorological conditions (e.g. wind speed and direction and air temperature) will be analysed;
- Respond to complainant with findings of the review;
- A record of complaints and enquiries logged, and Holcim's response, will be provided on a quarterly basis to the Town of Victoria Park for review; and
- The details of any dust-related complaint will be logged in a register, with investigation findings and actions noted.

Holcim will continue to maintain a telephone number and email address to be manned during all hours of operation to log complaints and enquiries.

3.5 Continual improvement

An annual review of the AQMP will be conducted after each year and the AQMP will be updated as necessary to address any specific matters identified by either Holcim or the Town of Victoria Park after each annual review.

4 References

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